THE

ART OF PREVENTING

THE

LOSS OF THE TEETH.

BY JOSEPH SCOTT,

DENTIST.

FIVE SHILLINGS AND SIXPENCE, BOARDS.

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ART OF PREVENTING

THE

LOSS OF THE TEETH.

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THE ART OF PREVENTING THE LOSS OF THE TEETH;

WITH

INSTRUCTIONS CALCULATED TO ENABLE MEDICAL PRACTITIONERS, HEADS OF FAMILIES, AND OTHERS, TRAVELLING OR RESIDING IN DISTANT PARTS, TO ADOPT THE AUTHOR'S PRACTICE OF TREATING THE

DISEASES OF THE TEETH AND GUMS;

INCLUDING THE

STOPPING OF DECAYED TEETH,

AND

Curing of Tooth-Ache,

BY THE USE OF

THE ANODYNE CEMENT;

ETC. ETC.

ALSO,

STATING THE IMPROVEMENTS IN FIXING ARTIFICIAL TEETH, AND A DESCRIPTION OF THE SILICEOUS PEARL TEETH AND TEETH-RENOVATOR; WITH TESTIMONIALS FROM THEIR MAJESTIES' PHYSICIANS AND SURGEONS.

BY JOSEPH SCOTT,
DENTIST.

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INTRODUCTION.

In offering to the Public a Work on the Science of Dentistry, so soon after the publication of a very able one, from the pen of Mr. Bell, I am not free from the unpleasant sensation of being considered presumptuous; but having, by an expensive perseverance, made several improvements, which I deem of great importance, in the method of treating the diseases of the Teeth, *as well as in the remedies, and substitutes for decayed and lost Teeth,* I became desirous of affording the public an opportunity of judging of the advantages to be derived from my discoveries, by adopting the present plan; and, considering that it might be serviceable to accompany the communication with a

statement of the most useful and general points of practice in this science, I have endeavoured to combine both objects in a manner which will, I hope, prove serviceable to society.

Being aware that there are but few persons (out of the profession) who are at all acquainted with the causes of, or the remedies for, the Diseases of the Teeth and Gums, nor with the facility by which their primary causes can be removed, I undertook the present task, in the hope of being able to instruct such persons to relieve themselves, when professional assistance cannot be procured; and also to enable them to judge whether the operations (both surgical and mechanical) of those dentists, under whose hands they may happen to fall, are skilfully performed.

For this reason I have concisely endeavoured to render the subject intelligible to those whose

avocations have not afforded them an opportunity of being at all acquainted with the operations of Dentistry; and, to prevent such Readers from having their ideas bewildered, I have abstained as much as possible from the use of technicalities. A practice recommended in all cases where the wish is to diffuse information.

I have also avoided the citation of too great a number of cases, to elucidate the practice I have recommended (and acted upon with general success), as tending to render the Work too voluminous and expensive.

Having said thus much on the necessity for a compressed Treatise (partly compiled and partly written) on this subject; and the advantages it offers to the Public, in preference to a more scientific and copious detail, which the zealous inquirer will find in the works of Hunter, Blake

Fox, and Bell, but which would be in contravention to my object, it may be expected that I should here say something of the improvements which suggested this desire. The Treatise itself will readily point out the variations which my practice has established, as being more beneficial than those of anterior date and use.

The improvements in other respects, consist principally in a new mode of curing the tooth-ache; stopping carious teeth, and of constructing artificial teeth, with their fastenings and fixings; the mechanical part of which is so well arranged, that, after being once fixed, they seldom require the subsequent attendance of the persons in whose mouths they are fitted; in addition to which, the composition of which the siliceous pearl teeth are made, is known only to myself, cannot be had of any other dentist, and is admitted, by the most eminent and scientific of the faculty and profession,

to be entirely divested of the whole of the imperfections of all other artificial teeth now in use.—(*See the Certificates, &c. at the end of this Introduction.*)

This consideration, without any thing further than what has been previously stated, will, I hope, afford an additional apology for my obtruding myself thus upon the public, a course which all who know me will give me the credit of being much averse to. In furtherance of these objects, I have arranged the work, both in the body of it, and in the appendix, in such a manner as to admit of an instantaneous reference to the immediate subject on which information may be required. And as many professional persons, and others, who might be desirous of acting upon my plan or method of treatment, reside abroad or in parts of the united kingdom distant from this metropolis, where it is difficult to obtain the assistance of a

scientific dentist, I have deemed it highly essential that such preparations as I use in my practice, and proper instruments for performing operations on the teeth (as detailed in the appendix), should be arranged in a commodious portable case. Such therefore, I have accordingly constructed, and denominated a "*Dental Case*," which all persons desirous of possessing can obtain on application to me.

Although this work may not be deemed of importance to the senior members of the faculty, those gentlemen who are emerging from their studies into mature practice, as well as surgeon-apothecaries, &c. in provincial towns, will by carefully adhering to the rules I have laid down, be enabled to relieve their patients without the necessity of extracting their teeth.

The formula of the various medicines required

in the operations directed to be performed in the course of the work will be found in the appendix, whereby gentlemen of the army and navy, clergymen, heads of families and seminaries, and, indeed, the public at large, will, in a great measure, be enabled to operate upon themselves or families.

In conclusion, I trust that this work will be found to contain what no other work yet published has—a compendium of the most essential points of dentistry ; as much so, indeed, as an abridged work of this description would admit of, namely, a certain guide to prevent the loss of the teeth, emanating from many years of experience and successful practice.

JOSEPH SCOTT.

6, Lower Grosvenor-street,
April 25, 1831.

CERTIFICATES, &c.

THE following letter was presented to the Author by Sir Astley Cooper (Serjeant Surgeon to the King), who received it from Mr. Bell, the Lecturer on the Anatomy and Diseases of the Teeth, at Guy's Hospital:

"My dear SIR ASTLEY,

"I have carefully examined Mr. Scott's Artificial Teeth, and have no hesitation in saying that I consider them infinitely superior to any thing of the kind hitherto produced. They have all the advantages of indestructibility which have been claimed for former inventions of the sort, and approach as nearly to the appearance of nature as I believe it is possible for art to effect.

"I am, my dear Sir Astley,

"Very respectfully, yours,

"THOMAS BELL.

"SIR ASTLEY COOPER, Bart.
Conduit Street."

"The foregoing Letter has been addressed by Mr. Bell to me, and I have thought it but justice to hand it over to Mr. Scott.

"ASTLEY COOPER.

"*March* 22, 1830."

The following Certificates were also presented to the Author by the Gentlemen whose names are attached, Physicians and Surgeons to their Majesties:

"Mr. Scott's invention seems to me to be original, and to promise important services.

"HENRY HALFORD.

"Curzon Street, Mayfair,
"*July* 30, 1830."

"Mr. Scott's invention appears to me to be very ingenious, and certainly much superior to any thing of the kind which I have had the opportunity of examining.

"B. C. BRODIE.

"Saville Row,
"*July* 30, 1830."

"I have examined Mr. Scott's Artifical Teeth, and think very highly of the invention. They are superior in point of appearance and colour to those invented by De Chemant, and in many cases will be found preferable to teeth made of bone, &c.

"H. EARLE.

"George Street, Hanover Square.
"*July* 30, 1830."

"Mr. Scott's Artificial Teeth appear superior to any thing of the kind I have ever seen.

"H. H. SOUTHEY.

"Harley Street,
"*August* 1, 1830."

TREATISE

ON

THE STRUCTURE

OF THE

TEETH

AND THEIR PROPERTIES.

Teeth are given to us by the great and all-wise Author of our being for the purpose of breaking and grinding our food, so essentially necessary to a good digestion; without which the whole of the animal system becomes deranged. Hence it appears, that upon the action of the teeth principally depends all the healthy functions of the body.

The teeth are vascular organised bones, possessing vitality, and are analogous to other bones, as regards their having nerves, blood-vessels, and absorbents, but are harder and whiter. They are commonly divided by anatomists into three parts;—the crown, neck, and fangs, and are placed one beside the other in the upper and under jaw. In adults (with a few exceptions) there are sixteen in each jaw; the part covered with

enamel* is called the crown; the part embraced by the gums is called the neck; the fangs or roots are buried and fixed in the alveoli or bone sockets, and are consequently bedded in the jaws, so that each tooth fills its appropriate socket, being separated only by a thin spongy partition. The tooth has an inner cavity, which begins by a small opening at the point of each fang, and becomes larger as it approaches the crown: these cavities are filled with nerves and blood-vessels; but in aged persons they are sometimes filled up with an osseous or bony substance; and in such cases the teeth become insensible. From the fangs, to a little beyond the sockets, the teeth are invested with a periosteum† attached to the gums, which is thin and vascular, and appears to be common to the teeth it encloses, and the socket which it lines.

The gums externally surround the teeth, and are also vascular, and very little sensible to pain. In infancy they have a hard ridge extending through their whole length, which performs the office of the teeth upon soft

* "The enamel is an extremely hard, milky white, semi-transparent substance, composed almost exclusively of earthy salts, principally phosphate of lime, containing a trace only of animal matter. It is the hardest of all animal substances, and consists of minute fibrous crystals, resembling in texture the fibrous carbonate or sulphate of lime; they are disposed in a radiated direction with respect to the centre of the tooth; consequently the combined external extremities of the crystals form the surface, and the internal extremities are in contact with the bony substance; so that their sides are parallel with each other."—BELL.

† A membrane, furnished with arteries, veins, nerves, and absorbents.

substances; but in adults, who have lost their teeth, this ridge is wanting.

There are four denominations of teeth, which are classed as follows:—viz. *incisores*, *cuspidati*, *bicuspidati*, and *molares*. The *incisores*, or cutting teeth, are eight in number (four in each jaw), and are situated in the front of the mouth: they are flat and sharp-edged, for the purpose of cutting the food; their roots are single. The cutting teeth in the upper jaw are fixed obliquely, and protrude so as generally to cover those of the like description in the under jaw.

Next to the cutting teeth are the *cuspidati*, commonly called "dog-teeth," so named from their resemblance to the teeth of that animal, they being pointed. They are also called the "eye-teeth," from the roots of those in the upper jaw reaching nearly to the orbits of the eyes. They are four in number, and are placed one on each side of the cutting teeth in both jaws; their roots are single.

The next two teeth on each side in both jaws are termed the *bicuspidati*, or small grinders. They appear at both extremities as if they were formed by the junction of two cutting teeth, having only one root.

The *molares*, or large grinders, are twelve in number, three being situated at each extremity of the upper and under jaw. The roots of them vary. In the under jaw they have only two, while those in the upper jaw have three. The extreme grinders of each jaw are further distinguished by the name of *dentes sapientæ*, or "wisdom

"teeth;" the roots of these appear compressed, as it were, into one, and are the last teeth that make their appearance. The surfaces of the crowns of the large grinders are full of indentations or irregularities, which renders them capable of grinding the food between them. The teeth on one side of the mouth correspond with those on the other side, both in figure and size.

Of the Formation of the Teeth.

The first appearances of the teeth in the jaws, before the birth of an infant, are soft pulpy bladders, bearing the resemblance and figure of the teeth about to be formed, and are each contained in a vascular membrane. About the fifth or sixth month of pregnancy, the tips of these pulps begin to ossify, or harden into the substance of bone, and gradually extends from the cutting edges over the pulp downwards. These are the temporary teeth, which constitute the first set, and are twenty in number;—viz. eight cutting teeth, four eye teeth, and eight grinders. Even at this early stage, there are rudiments of the formation of some of the teeth which are to become part of the permanent set. As ossification proceeds, the pulps of the temporary teeth are gradually converted into bone: on their under surface their roots are formed; and the bone on their crowns receives a crust of enamel.

Dentition, or Teething.

The first symptom of teething after birth is when the gums begin to inflame around the parts where the teeth are about to appear. The child is generally restless, but is always more quiet when its gums are rubbed with the fingers; and the saliva mostly falls from its mouth profusely; the bowels are usually relaxed, but sometimes the reverse of these symptoms is the case, which causes fever, that is attended with such an irritation of the system, as often to bring on convulsions. In such cases I would recommend emetics to be given in very small doses, every four or five minutes, till it has the desired effect, or an evacuation downwards takes place. The best preparation for this purpose is tartar emetic; opiates may also be occasionally given, as well as the use of the warm bath; but, above all, lancing of the gums over the approaching teeth should be adopted previously as a preventive and subsequently, not only as a cure but to prevent a recurrence, when the incision should be carried as deep as the tooth, which ought to be partially exposed. When this operation is properly performed, I have almost always found it give immediate relief, as the bleeding which follows is of considerable service in allaying the irritation of the gums; and the effects of it need never to be feared by parents, as it is

attended with no dangerous consequences, but, on the contrary, produces the most happy results. Indeed, where medical aid cannot be immediately procured, the operation may be performed by any person with a sharp penknife. Throughout the whole of this critical period, particular attention should be paid to the keeping of the bowels open, by occasionally administering magnesia and rhubarb.

Putting forth of the Teeth.

The precise time of putting forth the temporary teeth of a child seems to depend upon its constitution. Those of some children protrude as early as the fourth month after their birth, which is occasioned by the growing of the fangs causing the teeth to become too long for further detention beneath the gums, whereby the pressure causes absorption of the membranes and gums that cover them. Sometimes, indeed, children have been born with one or two fore-teeth already protruded, while, on the contrary, many children attain the age of fifteen, twenty, or even more, months, before the cutting of their teeth takes place; but the most usual time is about the sixth, seventh, or eighth month after their birth; those corresponding to each other protrude about the same time, the two central cutting teeth in the under jaw generally appearing first (one a few days before the other), and

then their antagonists: sometimes, however, the contrary happens, as those in the upper jaw first make their appearance; but in either case they are mostly followed by their opposites in about a month afterwards. These, in a few weeks, are followed by their laterals in the same order; in about three or four months after which, the anterior grinders of the under jaw come forth, and are shortly afterwards met by their antagonists in the upper jaw. The eye-teeth follow in a similar manner; and generally before the child attains the third year of its age, the posterior grinders shoot forth, and the temporary set of teeth are completed. The diseases of the temporary set of teeth require the same treatment as the permanent ones.

Of the Formation of the Permanent Teeth.

HAVING before stated that, in a very early stage of the formation of the temporary teeth, the rudiments intended to form the permanent or adult set, were in a state of progression, it is now necessary to mention that those rudiments are firmly and closely attached to the temporary teeth, contained in the same socket; and, as they become large, a division of the pulps takes place, a separate socket being formed for each. In this state they remain connected by means of the membranes and the gums. The pulps commence hardening on their tips: the process of their formation proceeds simi-

larly to the temporary ones. At the age of six or seven years, the jaws of a child that has not lost any of its teeth, contain twenty temporary and twenty-eight permanent teeth, together with the four sacs or pulps of the wisdom teeth. These four sacs, with the twenty-eight permanent teeth, constitute the thirty-two, or complete adult set. The permanent teeth are harder and most of them larger than the temporary ones, and are placed a little behind; consequently, during their growth, they are confined in the segment of a smaller circle than those whose places they are destined to occupy, and, as they ossify and enlarge in size, become much crowded in the jaws, being at that time forty-eight in number, exclusive of the four sacs. As the permanent teeth increase in length, the roots of the temporary ones are absorbed, which gives them a fractured appearance; and hence, no doubt, arose the erroneous opinion of some of the ancient anatomists, that the temporary teeth had no roots, and were pushed out by the permanent ones. But Mr. Fox, in his "Natural History of the Human Teeth," says, "that this cannot take place will be seen by observing the state of the two sets of teeth. The temporary ones are firmly placed in sockets, while the new teeth, during their formation, are contained in cavities larger than themselves, and can only make such pressure as their gradual growth will permit. On this account, if the absorption of the old tooth be retarded, or the formation of the new tooth proceed too quickly,

the latter will take an improper direction when they come through the gums, and form a second row of teeth, from the temporary teeth still remaining. Moreover, if the old teeth were pushed out by the new, we should always find those teeth about to be displaced, forced out of the line of the others,—a circumstance which never occurs."

Of the Shedding of the Temporary Teeth.

The shedding of the temporary teeth, to make room for the permanent teeth, is a wonderful instance of the wisdom of the Creator. This operation commences about the sixth, seventh, or, at the farthest, in the eighth, year of a child's age, when the anterior grinder of the permanent set (which is always the first to be seen) discovers itself, the two central cutting teeth of the temporary set soon afterwards become loose and fall out, and the permanent ones appear in their stead within a short period of each other. In the course of two or three months afterwards, the large central cutting teeth in the upper jaw also loosen, and, on dropping out, are succeeded by the permanent ones of the same description. After a lapse of three or four months more, the lateral (or side) cutting teeth in the under jaw are removed and replaced in a similar manner; and, shortly afterwards, those of the same description in the upper jaw follow in the same way. In less than twelve months af-

terwards, the temporary grinders begin to move, and are generally shed before the eye-teeth, the first small grinder of the permanent set occupying the place of the first temporary grinder; and, about the same time, the second temporary grinder and the eye-teeth become loose, and the second small permanent grinder takes the place of the second temporary grinder; some time after which, the eye-teeth occupy the place of their predecessors. About the twelfth or thirteenth year, the second large grinders are protruded; and about the seventeenth or eighteenth year the wisdom-teeth may be expected; but sometimes their appearance is delayed to a much later period, even beyond the thirtieth year. These are the last, and complete the adult or permanent set.

Of preventing the Irregularities of the Teeth.

The irregularities of the permanent teeth arise principally from improper treatment of the temporary ones during the time of their shedding. Sometimes they are extracted too soon and sometimes too late to admit of the permanent ones occupying their proper station in the dental circle. The disfiguration caused by such an occurrence is too well known to need much comment here. A too crowded set of teeth, if not timely attended to, will cause diseases, which, sooner or later, will destroy the finest and best set of teeth. I have generally found, that

the surest way of preventing irregularities, is to leave Nature more to herself in performing her operations than is usually done. I do not by this mean to deny that there are not numberless cases in which the extraction of temporary teeth are necessary to preserve the symmetry of the dental circle. To effect the desirable object of a regular arrangement of them, the progress of the permanent teeth should be narrowly watched by a dentist well acquainted with the anatomy of the jaw; for I am persuaded that much injury, independent of the cruelty, has arisen from extracting teeth before the proper time, by which impropriety the membraneous cord which connects the permanent tooth to the temporary one is destroyed; and thus the protruding tooth is predisposed to premature destruction by the deficiency of its formation: but this is not all; as long as the temporary teeth remain, they preserve the proper dimensions of the jaw by preventing its contraction, a material point to be observed, and requiring much judgment, as, from the contracted circle of the jaws at this early age, most of the irregularities of the teeth arise. Upon this point, Mr. Bell observes,—"I have known no less than eight, and even ten, firm teeth, forcibly removed from the jaws of a child at once. I will not employ the terms of indignation and disgust which such barbarous quackery deserves; but surely the unnecessary infliction of pain, upon the plea of preventing an evil, which, in the majority of instances, there is not the slightest reason to

apprehend, and which, even where it might occur, can always be detected in time to obviate it, is of sufficient importance to deserve reprobation. * * * * But there are other and more important reasons for avoiding the early removal of the deciduous teeth. It should be remembered, that the connexion between the temporary tooth and the succeeding permanent one continues to exist by means of the cord extending from the sac of the latter to the neck of the former, which must be torn through, if the temporary tooth be removed before the sac is absorbed. Until, therefore, the secretion of the enamel is perfected, which is not the case until a short time before the edge of the tooth passes through the gum, the extraction of the temporary tooth may very probably interfere with the healthy and uniform deposition of this substance.

" There is yet another evil resulting from this empirical mode of treatment, which has hitherto been unaccountably overlooked, but which should be impressed on the mind of every practitioner to whom the care of the second dentition is entrusted. The temporary teeth, as long as they remain in the sockets, from being arranged in a continuous and even series around the arch of the jaw, tend to preserve its form, and prevent its contracting during the growth of the child, when every part of the body is undergoing continual alteration, in form as well as in size. By the time that these teeth have become loosened, the permanent ones, in the natural course of the change, are ready to fall into their place, and thus

the correct form of the jaw is preserved; but if the temporary teeth be removed before the permanent ones are so far advanced as to be ready to occupy their situation, the support of the alveolar processes being thus lost, the arch of the jaw contracts, and when, subsequently, the permanent teeth are fully formed, there is not room for them to range in their proper situation. Thus the operation which was intended to prevent irregularity, becomes the cause of its occurrence, and that in its very worst form; producing a want of accordance between the size of the teeth and that of the jaw. I have seen so many instances in which this result has taken place, that I have perfect confidence in stating the opinion."

The following rules will in some measure be a guide to those parents who cannot at all times procure the advice of a scientific practitioner. They are those recommended by the above-mentioned gentleman, whose opinions and practice I highly approve of, and refer the medical practitioner to his more copious description in his "Treatise on the Diseases and Anatomy of the Teeth," pp. 89, &c., which rules I have here briefly extracted as follow:---

"If the inferior central permanent incisores (the two middle cutting teeth in the under jaw) have actually appeared through the gum behind the temporary, the latter, even if they be not yet loosened, may be removed; though I have seldom or never found any ultimate injury to result from leaving them even till the permanent ones

have acquired considerable size, unless where the jaw itself has been ill formed. Should the removal of the two central incisores of the first set be found insufficient to allow of the others coming forward, it is better not immediately to remove the temporary lateral (side) ones, until the permanent laterals are ready to pierce the gums; and even if these should in their turn require additional room, the temporary cuspidati (eye-teeth) should not be hastily removed, as they are of importance in preserving the natural form of the arch, and should therefore be retained as long as possible.

In regulating the incisores of the upper jaw, however, more frequent examination, and, often, the earlier extraction of the temporary teeth, will be necessary, for the following reasons:—It is to be remembered, that the teeth of the lower jaw close behind those of the upper when the mouth is shut: when, therefore, the *lower* incisores come irregularly, as they almost invariably appear behind the temporary, there is no obstacle in the situation of the upper teeth to their ultimately assuming their proper arrangement when the temporary impediments are removed: but in the *upper* jaw the permanent incisores have made their appearance behind the temporary, and have advanced so far prior to the removal of the latter, as to fall *behind* the lower ones, in closing the mouth, these will of course form a permanent obstacle to their coming forward into their natural situation. From this circumstance, joined to the great comparative size of the teeth

in question, it is frequently necessary not only that the central, but also the lateral, temporal incisores of the upper jaw should be removed. This should, in fact, be done as soon as it can be ascertained that the permanent central incisores are actually coming through the gum, behind the temporary; leaving, however, an interval of a few weeks between the removal of the central and that of the lateral incisores. For the same reasons, the upper temporary cuspidati must, under similar circumstances, be removed, when the permanent lateral incisores are appearing behind them, provided that the loss of the temporary lateral incisores have not afforded sufficient room.

"As the bicuspides (small grinders) usually appear before the cuspidati, the loss of the temporary molares (grinders.—See shedding of the temporary teeth), which are larger than their successors, will, in most cases, make room for them and the cuspidati; but, if the latter appear first in either jaw, provided the teeth of the other jaw do not present any obstacle, there will be no occasion to remove the temporary molares until the bicuspides are ready to emerge through the gum, and it can be ascertained whether the arch of the jaw will be of sufficient extent for the ultimate regular arrangement of the teeth.

"From the situation in which the bicuspides are placed during their formation—that is to say, immediately underneath the bodies of the temporary molares, and encompassed, as it were, by their roots,—these teeth

seldom assume any regular position. When, however, this is the case, the lower ones are generally directed inwards towards the tongue, and the upper take a contrary situation, projecting against the cheek. The temporary molares have, in most instances, lost the greater part of their roots before the appearance of the bicuspides, although, perhaps, they have not fallen out, or even become much loosened; as they are frequently so firmly wedged between the temporary cuspidati and the first permanent molares, as to form a considerable obstacle to the regular situation of their successors. But whether this be the case or not, still those teeth should not be hastily removed, as they contribute so much to the preservation of the proper expansion of the jaw, and thus reserve the necessary space for the cuspidati; for it certainly often happens, that in consequence of the too early removal of the temporary teeth, already mentioned—under a mistaken idea that this has been necessary, in order to give room to the permanent—the jaw has been allowed so far to contract, that by the time the permanent incisores and bicuspides have appeared, the space previously occupied by the whole of the temporary teeth is entirely or nearly filled, and there is not room in the arch for the cuspidati, which are consequently driven out of the line, and project forwards in an unsightly and dangerous position. If, therefore, the temporary molares can, without risking the permanent irregularity of the

bicuspides, be retained until the cuspidati are nearly ready to come through the gum, considerable advantage will be gained by it.

"In all these circumstances, much must, of course, be left to the judgment of the operator, in deciding what may be required by the peculiarities of each individual case."

By perusing the above, it will appear that the irregularities of the teeth mainly proceed from three causes :— 1st. From a natural want of sufficient expansion in the jaw-bone at the time of their protrusion ; 2dly, from not extracting the temporary teeth at the proper time ; and 3dly, by too early an extraction. The deformities proceeding from these causes are so numerous, that to describe what have come under my own observation, would swell this Treatise far beyond the limits I propose. I shall, therefore, only describe two cases which occurred in my practice, to shew how much may be effected by skilful treatment in removing irregularities which deform not only the mouth, but the whole aspect of the countenance. I shall confine myself to the bare relation of these cases and the methods I used to remove them, without entering into detailed directions for general application—more especially as such deformities can seldom be removed but by skilful practitioners.

Between two and three years ago, a lady, twenty-five years of age, applied to me for advice concerning a great irregularity in the front teeth of her upper jaw ; she had

formed the resolution of having them all extracted and placed upon a gold plate, as is the practice of most dentists in similar cases. I examined her mouth, and found the right central cutting tooth projecting beyond the dental circle more than the eighth of an inch, and the left central one was as far removed from the circle, in a reverse position, inclining towards the tongue, being a distance of more than a quarter of an inch from the extreme cutting edge of one tooth to that of the other; the right and left cutting teeth, and the eye-tooth on the left side, were also irregularly situated, which, by causing the lips to protrude, gave a hideous appearance to the mouth, and although this lady was several years past the age at which it is customary to regulate the deformities of the teeth, the great objection I have to the unnecessary extraction of teeth, induced me to request of her to allow me to try an experiment, the failure of which could be attended with no other inconvenience than delay, as the teeth could afterwards be extracted and placed upon a gold plate, in the manner she originally proposed them to be. She consented; and with the loss of only one tooth, instead of six, and other means which I adopted, the whole were, in less than two months, brought to inflect with the proper curve, to the great satisfaction of herself and family. The lady called on me a few months since, when I found that her teeth were perfectly firm and sound.

In 1824, when residing in Soho-square, I was con-

sulted, by the parents of a young lady, then about sixteen years of age, concerning the irregularities of her teeth. I accordingly examined her mouth, and found that the deformity was occasioned by several supernumerary teeth which had protruded themselves behind and between the cutting and eye-teeth of the upper jaw, thereby forcing the front teeth out of the curvature of the dental circle. By extracting these intruders, the regular teeth regained their proper situation.

I will here introduce a case, to illustrate the want of that anatomical knowledge of the structure of the teeth frequently evinced by some of our fashionable and most favoured dentists. A young and handsome lady, about nineteen years of age, had the misfortune to have the uniformity of a beautiful set of teeth spoiled by the left lateral cutting tooth, in the upper jaw, protruding and, as it were, lapping over the central one on the same side, caused by their crowded state. The family dentist had been consulted on its unsightly appearance, and he recommended the extraction of the tooth thus irregularly situated. The parents not aware of the evils attendant upon the loss of a front tooth, with respect both to articulation and appearance, consented to its removal, which left a frightful gap, attended by the evil consequences above stated. Upon the discovery of the injurious nature of the loss, I was consulted by the lady's father as to whether any means of rectifying the defect could be devised. On examination I found that the cutting tooth

had been injudiciously extracted instead of the first small grinder, at once exhibiting a want of knowledge of the first principle of dental surgery—never to extract a front tooth when it can possibly be avoided (as in the present case it might have been), for upon their symmetry depends the beauty of the appearance of the mouth. In this case, I proposed to fill up the space with an artificial tooth, but this was objected to on account of her youth. No other remedy, that I was aware of, remained; but I in some measure consoled the parents, by remarking, that the inclining of the remaining teeth, for want of their lateral support, would, in progress of time, considerably reduce the space left between them by the loss of the tooth. I saw the lady a few months back, at which time the point of the eye-tooth had nearly met that of the cutting tooth, notwithstanding which a large space still remained between them towards the necks, and destroyed the appearance of an otherwise beautiful set of teeth. Had the first small grinder, instead of the cutting tooth been extracted, the eye tooth could then have been assisted in making a retrogade inclination, and the irregular tooth by being assisted in the performance of a similar movement, would, by its approximation to the eye-tooth, have easily been brought to occupy its proper situation in the dental circle, and the appearance of the front of the mouth would have been entirely preserved, as the loss of the first small grinder, from its posterior situation, could not have been observed.

Of Supernumerary Teeth.

Supernumerary teeth are so called from their being exclusive of the number required to perfect a complete set. They are not shaped like the proper teeth, being rounder, smaller, and nearly resembling the point of a quill. They generally make their appearance in the upper jaw, about the cutting and eye-teeth, but are sometimes met with in the posterior parts of the mouth. They are always unsightly, and by forcing the teeth out of their circle destroy their regularity and create a considerable deformity. They should always, therefore, be extracted as soon as they are grown to a sufficient length to be laid hold of by the forceps.

Having thus given an outline of the progress and change of the teeth, when the expansion of the mouth and jaws admit of the adult or permanent set to succeed the temporary ones, I shall now proceed to treat

Of the Diseases of the Teeth and their Remedies.

Gangrene of the teeth is a disease formerly known by the name of Caries, or Rottenness, and is a succession of inflammations in the bone or crown of the tooth under

the enamel, through which it can be seen as a dark spot; sometimes lines appear between the teeth and on the irregularities of their grinding surfaces; and sometimes it commences on the neck of the tooth, near to the edges of the enamel, and, unless prevented in an early stage, will have the same destructive effects as when it makes its attacks between the grinding surfaces, leaving the enamel in part or altogether hollow (similar to a nut-shell, that retains its healthy appearance although its kernel is totally decayed) by mastication it breaks away, and a cavity is formed, whereby inflammation or tooth-ache follows as the natural consequence of the exposure of the internal membrane or nerve to any substance coming in contact with it, particularly hot or cold aliments, the effects of the atmosphere, &c., and unless the enamel is supported by some hard substance within the cavity, the whole will break away to the gums, the ragged edges of which it irritates, as it does also the external membrane, thereby producing absorption of the roots and sockets, gum-boils, caries of the bone of the jaw, &c. and is sometimes attended with such violent and continued pain as to be mistaken for the disease known by the name of *tic-doloreux.*

In extreme cases, where the inflammation cannot soon be allayed, extraction of the roots, when loose, should take place, as they are liable, by sympathetic inflammation, to injure the adjoining teeth. On the contrary,

when they are early and judiciously treated, they will quietly remain for years useful supporters to their neighbour teeth.

There are cases, however, in which portions of the bone and enamel decay and break away to the gums, which, although attended with inflammation of the latter, is accompanied by little or no pain, but is followed by absorption of the sockets to such an extent, &c. as gradually to loosen the roots, which being thus deprived of their support, fall away from the gums.

That the teeth are liable to various diseases and to premature decay cannot be denied, but that they are on that account less perfect in their formation or less durable than other parts of the human frame, I am not disposed to admit. The internal and external causes that predispose the teeth to disease are undoubtedly numerous—such as pregnancy, indigestion, fever, the use of mercury, producing inflammation of the gums and of the external membrane, &c.; also loose roots and their ragged edges, the accumulation of tartar, or, indeed, any thing which irritates the surrounding parts, has the same tendency; as has also the too great pressure of one tooth against another, thereby preventing their proper formation; sometimes the pressure of the permanent front teeth against each other is such as to break the enamel, leaving interstices that admit air, and the moisture of the mouth, which is composed of animal and vegetable juices

or substances, the putrefying and decomposing effects of which irritates the bony fibres, and causes repeated inflammations, ending in the destruction of the tooth, as before stated; sometimes the enamel is fractured by biting hard substances, as also by falls, blows, or taking aliments into the mouth when too hot or too cold, the frequent application of injudicious tooth powders, will so destroy the enamel of the teeth, and irritate the gums, as to be a primary cause of inflammation.

When inflammation of the gums, of the external membrane which covers the roots, or of the nerve of the tooth, takes place, the connexion of one part with the other is so nearly allied, that it is wholly impossible the disease can continue for any length of time in the one without communicating its baneful effects to the others. Thus diseases of the teeth are communicated by sympathy, and not, as generally supposed, by the contaminating influence of a virulent discharge, as the latter can never affect a sound tooth. A mistaken notion on this subject, has induced many practitioners to recommend the removal of both teeth and stumps, when, in fact, the former might have been preserved to the latest period of life as useful organs of mastication, and the latter would prove a firm support for fixing artificial teeth upon, so as to preserve the appearance of the visage; both these useful purposes are destroyed by a too hasty extraction, a repetition of which produces hollowness of the cheeks and the approximation of the nose and chin. From prac-

tical experience, I feel confident in stating that the evil effects arising from inflammation may be prevented by timely and skilful treatment in a majority of the cases where extraction takes place; and that the teeth are not only intended by the All-wise Creator to last for life, but that, with a few exceptions, arising from neglect or unskilful treatment, they are fully competent to that task.

One of the first symptoms of the decay of the teeth is, as before mentioned, when a spot or dark appearance is visible between any of the front teeth (this seldom happens with those in the under jaw). When this is the case, a thin file* should be passed between the teeth up to the gums, as early as possible, which in many cases is sufficient; but, if the dark spot extends, it must be cut out with the excavators, which is usually performed without any painful sensation whatever; but should the tooth be so tender as not to allow of the removal of the whole of the dark bone at one time, a bit of lint should be dipped in the sedative (See Appendix), and put into the cavity of the tooth, which will remove all sensibility of the nerve, and prevent the inflammation from spreading further. To effect this purpose, it has been a very prevalent practice, not only in this country, but on the Continent, to introduce, into the cavity of a painful or tender tooth, a *red hot wire*, which is termed cauterizing. This

* See Appendix, under the head "Gangrene, or Caries."

injudicious practice is calculated (as is the introduction of any hot substance) to destroy the bony surface of the cavity, thereby producing a decay of a far worse nature than that which it was intended to remove, and rendering it unfit to receive stopping of any description, from the rapidity with which the cauterized surface becomes dissolved by the saliva; or it produces a more violent inflammation in the internal membrane, or nerve, and the surrounding parts, which must eventually end in the loss of the tooth, unless timely applications be resorted to.—(*For which, see Tooth-ache.*)—This barbarous practice of introducing a red hot wire, must have originated with some person unacquainted with the nature of bone, or he would have been aware that heat destroys the gelatinous substance of it, and that a less powerful fluid than the saliva would afterwards readily soften and dissolve the cauterized surface.

As the tenderness subsides, a portion of the dark or decayed part should be removed from time to time, until nothing but white or healthy bone is to be seen;* at which time should the nerve be exposed, care should be taken not to wound it, as considerable pain would thereby be occasioned; which, however, may soon be removed by repeatedly dipping the lint into the before-named sedative, and filling the cavity therewith. If, after the repetition of the application, relief should not be afforded, a drop of the anodyne cement should be

* This mode of excavation applies to any of the teeth.

put into the cavity of the tooth (*See Appendix*), which, in its liquid state, adjusts itself to the cavity and nerve, to the latter of which, from its healing nature, it acts as a plaster, and also guards it from all external irritants, renewing it from time to time, until the nerve is absorbed, or dies away, which is sometimes accomplished in a few days; but in some cases its absorption, although certain, requires months; after which it may be stopped with the permanent composition (*See Appendix*) or gold *.

The points to be attained in excavating a tooth, are, 1st, to preserve the edges of the enamel round the cavity; 2ndly, to hollow it out in such a manner that the stopping, when in the cavity, should assume, as much as possible, the shape of a cone, the broad end being downwards: 3rdly, Great care should be taken

* "When the bone has become softened by decay to such an extent as to occasion pain on its being pressed, the total removal of the decay would of course expose the membrane, and render it impossible to fill the tooth without producing the most severe pain, and consequent inflammation. Notwithstanding this obvious effect, it is extremely common for persons to fill teeth in this state, either without removing the decayed part—in which case the dead and softened bone is forced into contact with the membrane—or, on the other hand, if the decay has been excised, the gold itself is pressed upon the naked nerve. In both cases the effect is the same. The membrane, in some instances, becomes extremely inflamed, this is communicated to the periosteum and socket, and at length suppuration takes place after long continued and most severe suffering. In other cases, when the membrane is exposed only to a very small extent, symptoms are occasionally produced which can scarcely be distinguished from *tic-douloureux*. If the cause of these attacks be understood in time, they may sometimes be relieved by the removal of the stopping, and by the application of leeches to the gum, and of some soothing remedy to the exposed and irritated nerve."—Bell, 147—8.

that a thin portion of the bony substance of the tooth (even if decayed) should be left to support the enamel; otherwise, the points of crystallization will inevitably break in. The above remarks being attended to, the cavity of the tooth should be filled with lint dipped in alcohol, or spirits of wine, for the purpose of removing any loose particles of bone that may be remaining in it; after which it may be wiped out with some dry lint, when the stopping may be introduced, as before directed.

It not unfrequently happens that front teeth (owing to their thinness or want of cavity) are not capable of being permanently stopped. In such cases, the only plan is to remove the decayed part, as before stated, which may be done without danger of injury, and stopped with the anodyne cement until they are no longer sightly, when a renovator (*See Renovator*) may be worn, or the remainder of the crowns be cut or filed off, and grafted.—(*See Grafting, or Pivoting*).

When decay commences on the grinding surfaces of the back teeth, the operation of stopping is easily accomplished, and of certain success. When lines or spots appear through the enamel of the grinding teeth, unattended with pain, it is better to leave Nature to her own operations, as such teeth may last for many years. If an aperture, however, sufficient to admit of the smallest excavator (*See Appendix*) can be perceived, it may be further enlarged by the enamel cutter, and the excavation and stoppage be proceeded with as above; after which they

will be as useful in mastication, and as free from pain or inconvenience as they were before their decay commenced*.

In difficult cases, it has been the practise with some dentists to extract a front tooth, for the purpose of stopping it with more facility and precision, and afterwards to replace it in its socket, and the tooth, to all appearance, has become firm ; but it only remains so for a short period, and the practice is now discontinued.

Other operations have been tried, but have proved unsuccessful, with the exception of pivoting or grafting the crown of an artificial tooth to the root, after the decayed crown has been filed or cut off; from which two great advantages (prevention of pain and sightly appearance) are derived ; for the pivot, being properly adjusted, answers all the purposes of plugging or stopping, and ever afterwards prevents all possibility of pain from

* "A gentleman has just paid me a visit, who has been my patient since the age of eight. During one of his vacations I saw some incipient disease and stopped it:—Twenty years have elapsed, yet I found the same old stopping which I had inserted in one of the large first double upper permanent teeth, and also in one of the large under double teeth. I have no hesitation in affirming this to be one of the most important and useful operations that can be performed." —SIGMOND.

"By the beautiful and useful operation of stopping or plugging teeth which are greatly decayed by caries, they may be preserved for many years; in most instances, during the remainder of life; and not unfrequently, from ten to twenty teeth may be preserved by this operation in the same individual."—KOECKER.

"If repeated inflammations be submitted to, a cure will be performed in time, by the stump becoming totally dead."—HUNTER.

that tooth, and, when skilfully performed, is decidedly the most perfect operation of the dentist. For the method of performing this operation well, so as not to cause inconvenience afterwards from pain or swelling of the face, evils so much complained of by those who have unfortunately experienced them, from injudicious practice,—(*See Grafting, or Pivoting*).

Of the Diseases of the Gums and their Remedies.

When inflammation of the gums takes place, which may be known by their unusual redness, tension, pain, and swelling, the first thing to be done is to remove the tartar from the teeth—(*See Discolouration of the Teeth*), should there be any collected ; if, however, there be none, leeches should be applied to the inflamed part between and about the neck of the teeth, which generally has the desired effect. When the inflammation is violent (as is frequently the case after the use of mercury), application should be made to a regular dentist, or surgeon, to unload the vessels of the gums, by a free use of the lancet, which should be inserted between the teeth, and the gums cut perpendicularly down to the sockets, after which a horizontal incision should be made, so that a plentiful discharge of blood may ensue, to encourage which, the mouth should be washed with warm water for a few minutes, and afterwards with an astringent lotion (for which see Appendix, and also for an aperient

to be used at the same time), and sometimes tonics are necessary to complete the cure. The above operation of lancing the gums should be repeated at intervals, which must depend upon the nature of the case and the judgment of the practitioner, until the gums acquire a healthy appearance; but should never be performed until after the cessation of taking mercury, as otherwise, ulcers of a very difficult nature to cure, might result from it.

After bilious attacks, fevers, &c. the gums generally appear inflamed, and bleed on the slightest touch; the teeth also are more or less covered with a mucus and tartar. This inflammation of the gums may often be seen in the mouths of the most healthy persons who have neglected the necessary brushing and cleaning of their teeth, and is commonly called Scurvy of the Gums; but I have reason to believe that such a disease seldom if ever occurs in the gums, except when other parts of the system are scorbutically affected. Such appearances, therefore, are nothing more than a local inflammation increased by an accumulation of tartar, which I have mentioned in the preceding paragraph, and must be treated as there directed.

Of Gum Boils and their Excrescenses.

This complaint is often the effect of colds, external violence, &c. but is more generally consequent on tooth-ache. It makes its appearance by a painful swelling on

the gums, which extends itself to the face. This swelling if not opened by the lancet, will point and burst, and unless it proceed from a decayed tooth, the complaint then disappears. But I have always found whether the complaint originated in a decayed tooth, or otherwise, the best mode of treatment was to make an early and a deep incision, and to administer sedatives and astringents. Where this treatment has failed, I have always found it necessary to extract the tooth, to prevent more injurious consequences.

Other excrescenses also arise, which may generally be extirpated by the use of either the knife or scissars, after which lunar caustic should be applied, and by the application of styptics a cure will generally be effected.

Of Abscesses of the Antrum, or Bones of the Cheek.

This disease arises from the same causes as the preceding, being an inflammation which extends upwards to the cavity of the cheek-bone, and also to the eyes, nose, and ears, attended with pain and swelling of the face, and a formation of matter in the sinus, or cavity, which encloses the sockets of the grinders. Sometimes the matter finds a passage between the roots of the teeth to the edges of the gums; but at other times it takes a contrary direction, and passes through the nostrils; in the latter stages of the disease, it tends to point in

the cheek. The cure is performed by giving a free vent for the discharge of the matter, which is effected in two ways; 1st, by extracting the decayed tooth, the removal of the roots of which sometimes gives vent to the pus; but, when this is not the case, an opening must be made by a trocar being thrust through the socket into the tumour. 2dly, In those cases where the tumour does not arise from a decayed tooth, which is seldom the case, the perforation is made through that part of the antrum which projects over the exterior part of the grinders. As soon as the matter is discharged, a plug should be introduced into the perforated part, which should be frequently removed to allow of the matter passing out, and to admit astringent solutions of bark, &c. to be frequently injected into the cavity, when, if the bones are not carious the cure will soon be effected.

Of Tooth-ache.

This distressing pain is so well known as to require no other description here than its causes and their remedies. Extraction is, unfortunately, supposed by many to be the only remedy for this tormenting evil; but I can safely affirm, from the extensive practice which I have had from my youth to the present day, that the cases in which extraction is necessary, are, indeed, very few. Upon this point I am aware that I am at issue

with one (and perhaps all) of the most scientific practitioners of the present day; but as this work is not written with the intention of arguing on abstruse points with the faculty, I shall merely give an outline of the causes of this excruciating pain, and recommend, with the confidence resulting from many years' successful practice, a different system from any hitherto practised.

Mr. Fox says, "It is not in our power to alter the laws of nature, or change the natural constitution of man; We can only obviate evils by attending to the causes which produce them; and it is in this manner we can, in a very great measure, preserve the teeth from disease."

One of the most important and distressing results from the causes alluded to by Mr. Fox, is the tooth-ache, which is an inflammation of the nerve of the tooth, or of the external membrane, common to the roots and sockets. This arises from caries, generally perceptible to the eye, although sometimes found lurking between the teeth: however, when it cannot be perceived by the eye, it may be discovered by striking the tooth with a metallic instrument, as the end of a pair of forceps or scissors; the effect of which increases or renews the pain for an instant, thereby pointing out the seat of the disease. Tooth-ache also proceeds from cold, pregnancy, diseased constitution, or whatever predisposes any other part of our frame to inflammation. Hence the nerve and blood vessels being exposed by the caries removing part of the bone of the

tooth to the effect of the atmosphere, or any external irritant, whether arising from mastication or other cause, produces the tooth-ache. In inflammations of the nerve, the vessels being expanded from an increased circulation, and confined within the bony chambers which contain them, not having sufficient room is the cause of that agonizing pain, surpassing an attack of a similar nature in any other part of the frame which is not so confined.

On examining the cavity of a diseased tooth in a state of inflammation, the nerve may be plainly perceived to have risen out of its chamber. In this case the use of the anodynes, as recommended in appendix, will remove the pain by causing the inflammation to subside, whereby the nerve returns to its original extent. If, after this period the cavity be skilfully stopped or plugged as I have before recommended in cases of caries, the tooth may remain serviceable for a number of years, if not for life, without pain or inconvenience.

Persons unacquainted with the nature of the teeth after obtaining relief from the tooth-ache, very frequently, if not indeed generally, neglect to take the proper precautions to prevent a recurrence of the evil from a dread of reproducing the pain from which they have just escaped, but this cannot arise from using the preparations recommended in appendix. The neglect of resorting to the remedies there prescribed will be attended with a return of the violent paroxisms from which they have been previously relieved, unless indeed the nerve should have

been wholly destroyed by suppuration in the first attack, but which I think rarely occurs, and the pain frequently ends in the swelling of the gums and face, of which I have treated under the head of gum boils—and it will then become necessary for the decayed tooth to be dressed as recommended in appendix.

Another common cause of tooth-ache arises from a decayed tooth breaking down to the edge of the gum, the latter being swelled from the effects before alluded to. In this state the abrupt edges of the tooth presses against and iritates the gums, so as to cause small red tumours or excrescences, which falling over the abraded edges of the tooth into the cavity, and, particularly in the act of mastication, pressing against the nerve, in conjunction with the pressure of the excrescence against the edge of the broken tooth, gives rise to inflammation of the nerve and its surrounding parts, which is accompanied with the most excruciating pain. These excrescences must therefore be cut out of the cavity with a pair of scissors, and caustic applied to the part, as mentioned in appendix.

After repeated inflammation, the nerve and vessel of the tooth sometimes emit blood and matter, and in this stage of the disease the pain is not so violent as in the preceding ones; but these appearances depend entirely on the state of the gums, the health and constitution of the patient.

In young persons, however, the tooth-ache is some-

times occasioned by the cutting of the wisdom teeth ; the inflammation of the gum arising from the protruding of which, extending itself to any diseased tooth, if such there be in either jaw, causing the pain. On all such occasions the gums should be repeatedly lanced, as recommended under the head of TEETHING, which will not only relieve the pain, but allow a free passage for the protusion of the coming tooth, paying attention to the diseased tooth in the way described in appendix, "*Tooth-ache.*"

Suppuration of the nerve or external membrane at the point of the fang, is the consequence of the absorption of the roots and sockets, and which of course must end in the loss of the tooth, and is the forerunner of gum-boils, as stated in the article "Gum Boils." An early attentention to the use of the anodynes recommended in the appendix will, in all cases previous and in many cases subsequent to suppuration, ease the pain, prepare the tooth for plugging, and preserve nine out of ten of the teeth which are now doomed to premature extraction ; unless, indeed, its antagonist tooth be wanting in the opposite jaw, as in this case, sooner or later, the tooth will be lost for the want of the stimulus the antagonist tooth would have afforded it, a defect which should always be remedied as soon as possible after extraction, by substituting an artificial one ; not only for utility in mastication and articulation, but also to give the natural stimulus just adverted to (so essential to preserve teeth in a

sound state), and for want of which, however sound the tooth itself may be, the external membrane of it soon becomes relaxed and its loss is inevitable; and should the tooth at this time be in a state of inflammation, it acts by sympathy upon the others as before mentioned, and the adjoining teeth are thereby endangered.

Of Plugging or Stopping the Teeth and the Substances Used for that Purpose.

The beneficial effects of skilfully plugging or stopping the cavities in decayed teeth are so universally admitted, and frequently adverted to in this treatise, as to render it unnecessary to comment on it here.

Of the substances used for this purpose gold is generally acknowledged to be the best, where the cavity will admit of its being introduced and retained; but the skilful preparation and using of it, is not so generally known as is imagined by many: nor can gold in a multitude of cases be used for the purpose. Other metals are also used, as lead and tin foils, silver and platina leaf, &c. All of which are highly objectionable, owing to the rapidity with which they are oxided, and being washed by the saliva into the stomach, where (as Mr. Bell justly observes) they "may materially disorder it," thus losing the proper proportions or dimensions, become so reduced that the cavity in which they may have been inserted

will no longer retain them. To obviate this difficulty a variety of expedients have been resorted to, among others, a fusible metal, the nature of which is described by Mr. Koecker, in page 395—as having been recommended by Mr. Fox.

In justice to the memory of Mr. Fox, I must be allowed to say that Mr. Koecker has misrepressnted him, for he merely states (Fox's *Natural History*, part II. page 148), that the method described had been *recommended to him* by a chemical gentleman, and that it promised to be successful. However, Mr. Koecker, in the observations he subsequently makes, very properly objects to the effect of the heat attendant upon the operation, when performed with the fusible metal there spoken of, as tending to destroy the vitality of the tooth; *but* Mr. Koecker has evidently formed an erroneous idea when he asserts that the fusible metal, recommended *to* Mr. Fox, on being poured into the cavity in its expanded state, will, as it cools, contract and leave interstices for the reception of foreign matter, &c. as the contrary is fully established to be the fact, and is known to be so by all men of science acquainted with the qualities of this particular metal.

In addition to the substance above alluded to, there are a variety of mineral succedaneums, amalgams or mixtures of mercury or quicksilver, zinc and other metals, used for the same purpose; and which are daily

advertised as being far superior to gold, under various names; such as adamantine-anodyne, &c. These deleterious cements have made more havoc in the mouths of those who have suffered themselves to be cajoled into the adoption of them, than could possibly be conceived by persons unacquainted with the circumstances. I have various specimens in my possession of the different kinds of stoppings now in use, which, fortunately for the sufferers, the shape of the cavity admitted of my removing from the teeth, while labouring under extreme pain, owing to the defective nature of the substances, and thereby restoring them to comfort and utility, by stopping them according to my uniform practice. These cements are applied in a fluid state without heat or pressure, and a part of the mercury which keeps them in that state being imbibed by the absorbents into the system, or evaporated by the heat of the mouth, becomes hard; (fortunately for many persons, however, a great number of these kinds of stoppings never acquire consistency owing to their falling out) but with such as remain the moisture of the mouth, more particularly when acid fruits, &c., have been eaten, influences the Galvanic action of the metals combined in these cements, and thereby not only the exterior surface is oxided, but the whole becomes a corroded mass, and in cases where the nerve has previously been exposed, I have generally found the cement a corroded black mass, staining and destroying not only

the tooth it occupied, but more or less its adjoining neighbours, and attended with a most offensive smell. A great proportion of the oxided matter being washed away, the remainder of the cement becomes honeycombed, as it were, and the atmosphere, &c., penetrating through the pores of this mass to the nerve, and (from the irritating nature of the compound) pressing upon the nerve, causes an inflammation frequently more violent than that it was intended to cure; and when the cavity happens to be well formed, there is great difficulty in removing the offending substance, the pain being so agonizing that few are able to endure it, consequently no alternative remains but to extract the tooth.

That some of the above cements have not given temporary relief, I do not mean to contend, but the attention I have given to the treatment of the teeth, and to which after a regular medical and surgical education I have devoted my whole study, which enables and authorizes me safely to say, they do not possess the virtues attributed to them in the advertisements of those, who, with the self-conviction of the want of every grade of the requisite knowledge to remedy a diseased tooth, have ventured to adopt the profession of surgeon-dentists to which they have in no way the slightest pretensions; and by blazoning forth the assumed merits of these specifics, have obtained a notoriety which has enabled them to practice, not only on the credulous, but even on those who

ought to have been aware of it*, and by which some of them are said to have acquired fortunes.

In the early part of my practice, it was the custom to extract all, or nearly all, unsound teeth that could not be stopped with gold or foils, from a dread of their communicating their diseases to the other teeth. As I decidedly dissented from the arguments used in support of this practice, I was led to the consideration of trying experiments of other substances for supplying the defect, so as to prevent the loss of so many teeth by extraction. In the pursuit of this object I was fortunately assisted by a general knowledge of chemistry, and received still further aid in my researches, by having the uncontrolled access to my father's laboratory, which had been used by him and his ancestors in the prosecution of that science for some generations. After repeated experiments which were attended with great expence, and a work of time, I succeeded in forming a combination of substances the qualities of which were not so liable to oxidation as any which had then, or to my knowledge have since, been discovered ;—and whose invaluable properties are such, that although used in a state of fluidity in filling

* One of the most eminent surgeons of the present day had the cavity of a tooth filled by one of the above named substances. In a few months it became porous, and the tooth was attacked by a violent pain, but it being next to impossible to remove the stopping without the most severe suffering, he was reluctantly obliged to consent to its extraction.

the caries or cavities of teeth, it neither possesses nor requires a degree of heat that can in the slightest way injure, much less destroy, the vitality of the bony fibres of the tooth (as is the case with the fusible metal), not causing any pain whatever to the patient, or be otherwise attended with those evils which are concomitant to the insertion of any of the other stopping substances before adverted to. It also possesses the quality of completely filling the cavity, and insinuating itself into the most minute irregularities to be found there, and of almost instantaneously acquiring a consistency which renders it artificially sound and competent to all the purposes of mastication, without the shadow of possibility of any of the dangerous consequences attending oxidation or corrosion resulting from it. In addition to which, it possesses the merit of being removeable at pleasure after years of servitude at a moment's warning, without pain.

I did not introduce my discovery into my public practice, until after I had tried its efficacy first upon one of my own teeth, and subsequently on some of those of my intimate acquaintances. The results of which were quite satisfactory.

The following is a statement of my own case. The last molare or grinding tooth of my mouth having been affected by caries, and the crown of the tooth considerably decayed with its enamel broken in the center of the irregularities of the grinding surfaces, early in 1821, without the least perception of pain, I filled the cavity with

my own composition, where it remained till the latter end of 1830, and I never experienced the least inconvenience from it. Being at that time desirous of ascertaining the state of the cavity and of the composition by means of a solvent I prepared for the purpose, I took it out, and to my great satisfaction, although nearly ten years had elapsed since its insertion, I found that it exhibited no appearance of being oxided, and that the bone had not made any further progress in its decay, I then stopped it again and in that state it now continues a useful organ of mastication, and had been before during the whole time entirely free from pain or inconvenience.

Hundreds of similar cases have since occurred in which my composition has been used, all of which have given the most entire satisfaction.

Of the Apparent Discolouration of the Teeth.

This is an evil which ought carefully to be avoided. De Chermant says, p. 5, " Of those parts which enter into the composition of a beautiful person, there can be no doubt but that the first place belongs to the teeth and the eyes; and if these latter are donominated the mirror of the soul, the teeth may be considered as the thermometer of health, and the principal ornament of the face."

That teeth become yellow or dark is well known, consequently they are then no longer an ornament, and

require the treatment of a skilful dentist to restore them to their pristine beauty. This discolouration is caused by the natural mucus of the mouth, and the particles of food remaining about the teeth, together with the secretion of salivary calculus or tartar, by which the teeth are incrusted, sometimes forming such dense concretions as to appear like a mass of bone, which generally gives such an offensive taint to the breath as can scarcely be endured at the distance of several yards*. When this substance is allowed to remain, it insinuates itself between the teeth and gums, irritating and inflaming the latter, as well as the external membrane that covers the roots. An absorption of the roots and sockets follows this inflammation, and is indeed the most common cause of loose teeth, by causing the gum to recede from the necks of the teeth, whereby they are in a great measure deprived of their natural support. This tartar must be removed by the aid of instruments, which is the operation called "scaling the teeth;" but as few persons can remove tartar from their own teeth, particularly when

* When the disgusting effects of its accumulation are considered, it would appear impossible that any persuasion could be necessary to induce persons to obviate so great a nuisance, even on their own account; or if they are too debased to procure their own comfort and cleanliness at the expence of a very little care and trouble, they surely have no right to shock the senses of others, who possess more delicacy and propriety of feeling than themselves. Yet so it is; and the sight and the smell are alike constantly outraged by the filthiness of people, who seem to obtrude their faces the closer in proportion to the disgust which they occasion.—Bell, p. 199.

the concretion is great, and the teeth, in consequence, are very loose, a dentist should be applied to; after which any person may prevent a repetition of its incrustation, as small particles might be chipped off, by the aid of the instruments contained in the case, the uses of which are described in the Appendix. The mode of performing this operation is to apply the instrument to the incrustation at that part of it which joins the gums, and break it off by forcing it upwards towards the edge of the tooth. Where considerable force is required to remove it, the tooth should be supported by placing a finger of the left hand upon the edge of it, to prevent its being shook or loosened by the operation. The same process should be performed on all the teeth requiring it, and the operation should be repeated as often as tartar collects; as a small portion of it prevents the gum from embracing the neck of the tooth. When all the tartar has been removed, the teeth and gums should be well rubbed with a brush charged several times with the absorbent dentifrice mentioned in the Appendix; and this should be repeated every morning without being alarmed at the bleeding of the gums which may follow the operation for the first few days, such bleeding being always beneficial, as it removes any local inflammation that exists, and renders the gums firm and healthy if the practice is persevered in. The teeth should afterwards be washed and again brushed with a cleansed brush, after which they should be wiped with a soft linen cloth on the outer and inner

surfaces, to remove any adhesion or mucus that has not been removed. When the above operation has been carefully performed, the teeth will be found to be restored to their natural pearly whiteness, which was before only obscured by the tartar. I mention this latter circumstance, because I feel convinced that there are many persons who think that the dingy appearance of their teeth proceeds from the decay of the enamel, and under this impression the incrustration is suffered to increase until the tooth, deprived of its support, falls out of the mouth in a sound state, to the astonishment of the person deprived of its services, who, unable to account for the occurrence, generally, but erroneously, attributes it to scurvy of the gums—a disease which, as before remarked, I do not believe to exist in the gums, unless the system be affected generally. Indeed, if it proceeded from scurvy, the disease would remain after the loss of the tooth; a circumstance which rarely, if ever, happens.

A great prejudice appears to exist against the practice of scaling the teeth, an operation which is generally admitted to be necessary to their preservation, as well as to their restoration, when incrusted with tartar. Many patients of mine have mentioned to me that they had acquaintances who attributed the loss of teeth to having had them scaled. That such a thing might happen, is not improbable, where the operation is carelessly performed. By this remark, I do not mean to say that the dentist can possibly injure the teeth by the operation, but by performing it carelessly; that is, when the incrus-

tation is not wholly removed, the portions of tartar remaining present a more rugged surface, and consequently forms a better foundation for a fresh accumulation than before its apex formation was destroyed. The substance that is constantly depositing itself around the teeth, making a lodgment for its reception upon the gums, which, to be better understood, I shall call eating of them away, and thus the re-accumulation of the evil is more rapid than at first; and, finally, the loss of the teeth follows precisely as if they had not been touched. The instructions I have already given, however, if perseveringly followed up,—namely, by removing any particles that may have either accidentally or carelessly been left by the dentist, or that may have afterwards accumulated; and carefully and regularly brushing them with the dentifrice, and washing them, will obviate these consequences. I shall here take the opportunity of quoting the remarks of an author, who wrote upon this subject some years ago, and states as follows:—"Cleanliness of the teeth is to the eye what purity of the breath is to the sense of smelling. Nothing is more pleasing than clean, white teeth, and gums of the colour of the rose;—nothing more disagreeable than foul, black teeth, thickly encrusted with tartar; this sight alone is sufficient to excite disgust, the most beautiful face being repulsive, if the lips, when they open, exhibit the slovenly spectacle of neglected teeth."

Having thus demonstrated not only the advantages of,

but the positive necessity for, a particular attention to the suggestions I have adduced, in order to prevent the discolouration of the teeth, it may not be superfluous to add, in conclusion of this part of the subject, that, to such persons as cannot procure the prepared dentifrice, I would recommend the use of common chalk in preference to any other unprepared substance; the daily use of this simple from childhood, and occasionally lancing the gums, as I have before mentioned, would, I am convinced, be attended with such beneficial results, as to preserve the teeth of the lower orders many years longer than they at present generally enjoy them, if not to the end of life. The principal cause of the diseases of the teeth and gums in such persons proceeds from a want of cleanliness, and not from the habit of eating highly seasoned meats, ices, &c. It is, nevertheless, highly necessary for persons desirous of preserving their teeth by dentifrices to be careful in their choice of them, as those which are commonly sold under the recommendation of beautifying and preserving the teeth are generally compounded of acid or gritty substances, both of which destroy, although they improve their appearance for a short time: the former thins the enamel chemically; and the latter wears it away mechanically *.

* The use of charcoal, finely pulverized, for cleaning the teeth, was formerly recommended by very eminent men, who, subsequently, from

It may here not be immaterial to state also, that the indispensible article of the brushes, used in cleansing the teeth, are worthy observation, as they are of different shapes and textures. Those, in my opinion, best adapted for this purpose, are formed narrow at one end, and have long hairs, or bristles, which, however, ought not to be too closely set, lest the water should be prevented from passing through, to remove the impurities they collect in using. I would also recommend the use of both hard and soft brushes, making a distinction in the use of them. For example, I use a hard brush to my teeth and gums in the morning, for the purpose of removing any accumulation of improper substances that may have formed during the night, but a soft one at any other time, as the too frequent use of a hard brush must have the effect of irritating the gums, although, when used but once a-day, it renders them firm and healthy. I have also a brush differently shaped, with a bend from the handle, the hair arranged in a small oblong square, which is better adapted for the interior of the teeth than the one generally used for the exterior. It

a conviction of its injurious tendency, publicly denounced it. The fact of charcoal's being used by many artists for polishing their work, evinces its operation on the teeth; as is the case with pumice-stone, brick-dust, soot, &c.; for all substances having the power or tendency to polish, must necessarily wear away the surface on which they act, and, as respects the teeth, soon wear away the enamel, and in time entirely destroy it. Under the appellation of charcoal, therefore, may be included all calcined substances.

is usual for most persons to pay more attention to the exterior appearance of their teeth than to the interior parts; whereas, in fact, it is in the latter, that tartar,* &c. concretes, more especially behind the cutting teeth of the lower jaw and the exterior parts of the grinders in the upper jaw.

Of Loose Teeth.

When teeth are loosened by external violence, such as falls, blows, &c. they may, in most cases, be again fastened by pressing them firmly into their sockets, where they must be supported by ligatures to any of the adjoining teeth that are sound. The patient must also be confined to spoon meat till they become firm; to effect which, astringents must always be used; and in some cases aperients also will be necessary; for which, see Appendix. But if their looseness proceeds from the incrustation of tartar, it must immediately be removed, lest absorption of their roots, and the sockets in which

* Tartar is an earthy concretion from the saliva, mucus, &c. of the mouth, which, at its first appearance, is soft, and may easily be removed; but if allowed to accumulate it acquires a hardness nearly equal to the teeth itself, of which, to an inexperienced person, it appears to from a part, but is in fact no more so than the *fur* (as housewives term it), on a tea-kettle, is to the metal on which it collects. It is of various hues, but is generally of a buff, dark brown, greenish, or black colour.

they are placed, should occur and the loss of the tooth or teeth become inevitable. Even when absorption of the roots and their sockets has partially taken place I have been fortunate enough to fasten them by cutting the gum down to the socket on each side of them; and by immediately applying a powerful astringent the gum has afterwards more firmly embraced the tooth. This operation requires in many cases to be repeated, and must be followed by strict attention to the daily use of the brush, applied freely to the gums as well as to the teeth with the astringent dentifrice, for which see Appendix.

Of Extracting the Teeth.

My experience in this branch of the profession has been great, having been in the habit of performing it, from a very early age, as that department of my father's practice generally fell to my lot. I have been compelled, against my individual opinion, to extract hundreds, nay, I may say thousands, of teeth, which, I am certain, might have been beneficially retained, for a number of years, by having recourse to the plan which I have adopted since I came into practice for myself, which is now upwards of ten years. My increasing experience daily confirms me in the justice of the opinion I had early formed of the too prevalent adoption of this injudicious practice; sometimes indeed professional men are compelled to extract teeth from the obstinacy and impa-

tience of the sufferer, and sometimes the necessity of the case imperiously demands its adoption. In the latter case the best mode of doing so has been so ably described by various writers on this subject, and is otherwise so generally known, that I do not deem it necessary to say more on this branch of dentistry, than that I give the preference to the forceps, as the most competent instruments for the extraction of teeth, in all cases where they can be safely applied.

As to this subject being considered of slight importance, and unworthy of eminent practitioners, if any man in his senses can really deem it so, it is scarcely worth while to attempt to confute him, by supporting a contrary position. How much more humane and honourable must it be, for any competent professional gentleman to extract a tooth when necessary, and afford relief to a patient, than, by refusal, or omission, compel him to resort to incapable operators, who, failing to complete their undertaking, leave, perhaps, the fangs of the tooth to be subsequently removed, or other serious injuries to be remedied?

Of Artificial Teeth.

It has frequently been observed to me that the teeth were less perfect in their structure than any other part of the human frame; but this opinion I have always dissented from, being firmly convinced that the teeth are go-

verned by the same laws which regulate and govern other parts of the system, and are therefore not more liable to disease. I have endeavoured to demonstrate in the foregoing pages, that by proper attention to the primary cause of disease (namely, inflammation of the bony part of the teeth, as well as the nerve and surrounding parts), in nine cases out of ten, a sufficient number of them would be preserved to answer all the purposes for which they were given by our all-wise Creator, to an extreme old age. Many unavoidable causes, however, concur to deprive us of their valuable services, such as accidents, uncontrollable diseases (comparatively few); but above all, the misfortune of falling under the hands of unskilful operators, who sometimes recommend their extraction, either from the interested motive of supplying their places with artificial ones, or from a want of the necessary skill to arrest the progress of the disease with which they are attacked, or some times both the last mentioned causes combine to deprive us of those useful and ornamental organs *. To the above causes may be

* In consequence of the complete, or even partial, ruin of the teeth, the face shrinks, the voice loses its harmony, becomes shrill, or is lowered, and the pronunciation, of course, very imperfect. The countenance assumes a different expression; is harsh or morose; the flesh of the cheeks will flag and hang down; wrinkles will prematurely furrow the face, the dimensions whereof are no longer the same as they were. The mouth and nose also change; the chin seems to be longer, and in reality approaches nearer to the latter organ; in short every part of the face is discomposed in a more or less offensive degree, and presents the anticipated sight of painful destruction.—JERBAUX.

added the eager precipitancy of the patients themselves, who, unfortunately, frequently insist on their extraction, from a mistaken idea of there being no other remedy to avoid the excruciating tortures they are suffering.

Having thus pointed out the causes which occasion the loss of the teeth, we now come to treat of the necessity of supplying their places with artificial substances, not only to prevent the derangement of the features, but also to restore the powers of mastication and articulation. De Chemant, page 8, says, "When the teeth are lost it is impossible to make use of solid food, and if the stomach is then loaded with pieces without being masticated, the person is exposed to the most distressing indigestions. The stomach loses its power of contraction, and it becomes weak in proportion as it no longer digests. We can only then remedy that state of languor which is the consequence by replacing teeth in lieu of those which are lost. Nature, which makes nothing in vain, would not have provided us with teeth if they had not been essential to us.

"Although the gums, after the loss of the teeth, may with some persons, to a certain degree, become hard; as the natural position of the jaws only permits the alveolar edges to touch, the aliments can only be slightly and difficultly pressed between the gums; in vain, in eating, the jaws attempt to meet; there is nothing but useless efforts, attended with contortions and grimaces which by degrees disfigure the face. Artificial teeth

prevent all these inconveniences, and those made of mineral paste serve for mastication, as well as the natural.

"Teeth are essential for the formation of articulate sounds; those who have lost their front teeth speak with hesitation, or lisping; artificial teeth remedy also these inconveniences, and likewise those involuntary jets of saliva when one speaks with volubility.

"Nature, which is as fertile in effects as she is economic of causes, makes use of teeth as an embankment against the overflowing of the saliva, phlegm, and other humours, with which the mouth is often filled. Without them persons who have the under lip more or less falling, and who want teeth, would let the saliva escape, a circumstance as distressing to themselves as it is disagreeable to those who approach them. Artificial teeth alone can protect us from this disgusting inconvenience."

Much labour and ingenuity have been bestowed on the construction of artificial teeth, which are now, from the precision of fitting at which a few dentists of the present day have arrived, found to answer all the purposes required, to the satisfaction of the wearer, and even beyond all former anticipations.

On the fixing of Artificial Teeth.

The mechanical art of fixing and fitting artificial teeth may now, in all probability, be considered as perfect as

human nature can devise. It is not likely, however, that any of my readers will attempt to make and place teeth in their own mouths, nor is it my intention to instruct those of my own profession through this medium, I shall merely give an outline of the process of fixing as now practised by the most scientific dentists as well as myself.

A model of the mouth is first taken; after which the number of teeth required are either constructed in one solid piece, so as to resemble both the teeth and gums, or separate teeth are rivetted on bone, or a gold plate, which has been previously fitted to the model. The teeth fixed on these plates are, according to the expressed wish of the wearer, natural or human, derived from dead bodies; animal, or those which are made from the enamel of the tusk of the hippopotamus, or sea-horse, or the porcelain commonly called mineral or terro-metallic; and this completes the whole process which is more or less serviceable and convenient to the wearer, according to the skill of the artist in adopting them to the formation of the mouth, and the anatomy of the jaws, the natural action of which is little, if at all, understood by some of our most fashionable dentists, as the following case will illustrate.

A lady of distinction informed me that she had had two pieces, consisting of five teeth each, successively placed in her mouth within eight weeks by one of the

most favoured dentists in London, but that both of them were destroyed in a few days after they were placed, owing to the pressure of the jaws, and wished to know whether it was in my power to prevent a repetition of such disasters. On examining her mouth I perceived that the cause arose from a want of anatomical knowledge of the jaw, and proper uses of the back teeth *. With the exception of the right eye-tooth, and the first small grinder on the left side, she had lost the whole of the teeth in the upper jaw. In the lower jaw she had lost the antagonist of the small grinder, and the six large ones consequently had only two small grinders on the side of the front teeth, and one on the other. The back teeth being all lost, the pressure upon closing the mouth fell upon the eye-tooth on the one side, which thereby became considerably worn ; on the other side the small grinder evaded the pressure, by falling into the space left by the loss of its antagonist ; hence the whole of the pressure of the jaws fell upon the five artificial teeth in the front of the mouth, and the consequence was, that in less than a month, the first *set* was broken, as were the second in about the same period, when she applied to

* With regard to the action of the teeth of both jaws, in mastication, we may observe, once for all, that their action and reaction must be always equal, and that the teeth of the upper and lower-jaws are complete, and equal antagonists, both in cutting and grinding.—HUNTER, p. 69, edition of 1771.

me†. To prevent a similar occurrence I recommended her to have the upper and lower back teeth replaced in conjunction with the front teeth, which she approved of, and the equilibrium of the action of the jaws being restored, no accident has occurred since that period, which is now upwards of three years, during which time they have given every satisfaction, as the lady herself has very recently informed me. The above error is one that is too generally fallen into, by inexperienced and consequently inefficient operators, denominating themselves dentists; but how such an oversight could have taken place in a gentleman of high professional reputation, of upwards of twenty years standing, is not so readily accounted for.

On examining the mouth of such persons as are furnished by nature with a well placed and complete set of teeth, we find the front teeth of the upper-jaw projecting over those of the under-jaw,—a regulation of nature wisely adopted for more easily separating the substances requiring to be divided; any exception to which, for example, in cases where the front teeth precisely meet, the cutting edges of each other, or where the front teeth of the under jaw project beyond those of the upper, in which case the person is said to be underhung (*see irregulari-*

† The premature loss of this lady's original front teeth, arose from the partial loss of her back teeth, by reason of which the pressure on the fore part of the mouth was so great, that the front teeth became loose, and finally dropped out, as is commonly the case when the whole or part of the back teeth are lost.

ties of the teeth), and is not only unsightly, but, particularly in the former case, where the edges of the teeth meet perpendicularly, causes the premature wearing away of the teeth, even to the gums, so situated, especially after the back teeth have been lost. This projection of the front teeth deviates gently from that line backwards on each side until the crowns of the large grinders and wisdom-teeth directly fall upon each other. Hence in the act of mastication, when the lower jaw is dropped to commence the performance of that operation, the grinders in that jaw are forcibly drawn forward out of their quiescent situations, and when the jaw is again raised, as it is in the second motion, the teeth in returning to their natural position encounter the food requiring to be masticated, and (in their retrograde motion) reduce it to small particles, which action is called grinding.

By the great friction of mastication, the teeth of some persons gradually wear each other away in a very perceptible manner. Some are worn pretty nearly upon an equality all around, while in others, from a habit of chewing on one side of the mouth, the teeth, which are in constant use, become so reduced in their crowns, as to cause a pressure upon the front teeth, almost equal to that which follows the total loss of the back ones. A case of this description occurred in the course of my practice some time since. The patient, a gentleman of high respectability, informed me that he had, some years

before, consulted a dentist on the occasion of several of his teeth being loose, and others wearing away from the unequal pressure they sustained from his having lost the chief part of his grinding teeth. The dentist to remedy the evil, supplied the places of the latter with artificial ones, to equalise, as he said, the pressure. The idea was correct, but his execution was faulty. The teeth which he had substituted never answered the purpose for which they were intended, owing to their having been from their first fixing too short to meet their antagonist teeth, consequently they failed in giving the least relief to the pressure in the front of the mouth. Nor did the evil rest here, the useless incumbrances placed in his mouth were fastened by clasps or collars to his remaining teeth (a most injudicious practice, although a pretended improvement), which rather increased the instability than added to the support of the teeth, and caused irritation whenever a sufficient quantity of food accidentally became placed between the grinding surfaces of his own teeth and those of the artificial ones, which, of course, was avoided as much as possible, owing to the pain it occasioned. The most superficial observer of the structure of the teeth must be aware, on reflection, that the small extent of socket occupied by one, or even two, artificial teeth, cannot, owing to a want of extension in the socket or foundation of resistance to the great pressure consequent on mastication, be borne by one patient out of five thousand. To remedy the defects complained

of by this gentleman, I recommended him to allow me to cap or cover the back large grinders and to half-cap the small front grinder with a thin plate of gold, so as to cause their surfaces to bear their due proportion of the action of the jaws, and to prevent its converging to the front of the mouth. He acceded to my proposition—I removed the clasps, and by making him a plate on a more extensive scale, which embraced the four grinding teeth in the following manner, namely, a cap for the large grinder at the back extremity, two artificial teeth of my siliceous pearl, of a sufficient length to remove the inconvenience complained of, as they now meet the surfaces of their antagonist teeth, these I rivetted on the center of the plate, with a half-cap on the front extremity for the remaining grinder, by which means the pressure became equally divided and restored to its original state, and he has since expressed himself in terms of the greatest satisfaction, as, by the removal of the clasps, he no longer complains of the irritation or loose state of the neighbour tooth occasioned by the action of them.

I might here cite a multitude of cases in which I have employed the system of capping the teeth with gold with perfect success; but I shall not here trouble my readers with a multitude of cases of intricacy, more especially as the readers cannot of themselves execute them; I shall, therefore, only state that this plan is calculated (where any back teeth are remaining) to sup-

port all the modifications required by the loss or abrasion of the teeth, without the necessity of extracting either them or their roots to accomplish it. In cases of the abrasion of the front teeth, as mentioned before, caused by the wearing away of the grinding surfaces of the back ones, nothing more is necessary to prevent the symmetry of the teeth from being destroyed, than to cover and fit accurately their indentations with a plate of gold, which, according to its thickness, will equalise the pressure on the front teeth.

In the fixing of artificial teeth, however, there are some cases, more particularly in the under jaw, in which the irritation of the gums is such, that metallic plates cannot be endured in the mouth of the patient; in such cases the artificial teeth, of whatever substance they may be composed, as dictated by the choice of the wearer, must be fixed upon beds or sockets formed of the sea-horse bone, &c., so as to fill up the vacancies between any two contiguous teeth which are firm in their places, and these are attached to them as circumstances admit, by silk or gold ligatures *, clasps or collars, and springs, all of which modes are objected to by many; the fault, however, rests upon the inaccuracy of fitting the part, for, if the artificial teeth be made too large, they press the other teeth out of their natural

* The custom of wearing ivory teeth tied with ligatures, is very ancient. Lucian and Martial speak of it as being practised amongst the Romans.

situation; and, if too small, the natural teeth approximate towards them, causing, in either case, the adjoining teeth to which they are attached to become loose; hence arises the prejudices of many to the use of artificial teeth; but to explain myself fully on the evils of neglecting to supply the loss of a single tooth by artificial means, would swell the present work beyond its intended bulk, and would, by many, be considered tedious; suffice it, therefore, to say, that the loss of one tooth is certain to be followed by the loss of its antagonist in the other jaw, if not by two, the number immediately affected by its loss in mastication from the collision of the teeth in performing that office, for the teeth work not (as commonly supposed) in pairs, but a tooth in one jaw acts upon the half of two teeth in the other jaw, consequently, the loss of one tooth causes the improper action of two teeth, which it before resisted, thus giving healthy action to the vascular properties, for the want of which natural stimulus the teeth and sockets become diseased, and thus the first loss is followed by the total disorganization of the symmetry of the teeth, which is as surely followed by a distortion of the countenance. On the loss of a tooth, therefore, I earnestly recommend that its place be occupied, as soon as circumstances will admit, by substituting an artificial one, to prevent, not only the evils above spoken of, but also to hinder the remaining teeth on each side, from approaching each other in an oblique

direction, which they most assuredly will do, unless kept in an upright position by artificial support, and render them less efficient, if not altogether useless, in the act of mastication. It requires little calculation, therefore, to discover how soon thirty-two teeth may be destroyed, when we consider how materially four or more teeth are injured by the loss of one.

But to return to a description of the different modes of fastening artificial teeth practised by different dentists; I shall first consider the customary method of tying them with silk or gold ligatures, which appears to be the most ancient mode known, and is used by many dentists at the present time; but I am decidedly adverse to the use of ligatures, because of the necessity that exists (in order to secure such teeth in their places) of drawing them so tight, that the natural teeth are often loosened by the operation, added to which, the wearer finds a difficulty to tie them without assistance, when removed for the purpose of cleansing. Collars are equally objectionable from their dragging and impulsive effects. In the commencement of my practice I saw the inconvenience and disagreeable consequences resulting from both, and applied myself to remedy these defects; this I have partly accomplished by a kind of half collar for the inside of the tooth, which, without the liability of being perceived, as clasps or collars are, does, by its elasticity, in a great measure prevent the jarring effects produced by mastication or removal. But of all the modes yet invented for the fast-

ening of artificial teeth I prefer that of capping, where it can be done with propriety. This is done by casing the natural teeth in the vicinity of the defect, by which means the plate for a single tooth, or more, may be extended to a sufficient distance, so as to prevent the appearance of any gold spring or other fastening from being observed, and to obviate the pain arising from pressure on the gums produced by plates of small dimensions.

There is another method of fixing artificial teeth which has been much advertised as possessing the properties of "Capillary attraction and pressure of the atmosphere," or, as others term it, "the attraction of cohesion." This mode is not new, although professed to be, but it can only be performed by the best artists; nor can it in reality be successfully applied in more than a few cases, and where the gums are naturally of a sufficient depth, &c. to support the quantity of bone necessarily required to complete an upper semi-circle. Its adhesion depends upon the accuracy and extent of surface with which the artificial bone-piece is made to fit the corresponding part of the mouth. Indeed, the ease and utility of artificial teeth, in all cases, depends upon the accuracy of the fitting, whether adhesion be required or not. I frequently fit to the full extent of this principle when required so to do by the caprice of my patient, but I never recommend it when my judgment is consulted, particularly in the upper jaw, and in this respect I am strongly inclined to suppose that the scientific part of

the profession (although few) agree with me. My objections to depending on it are, that in adapting pieces to the upper jaw, such a quantity of bone must necessarily be retained in the mouth as to cover the greater portion of the palate, and consequently produces a defective taste together with an invincible impediment to articulation. In many instances (more particularly where *complete* upper pieces are applied) the defects above complained of are rendered still greater by the frequent occurrence of the piece becoming displaced in conversation, but more particularly in oratorical displays, where the delivering long sentences is almost certain to produce this disaster, or at least to require a continued and disagreeable practice of suction to retain it in its place. I have known it to be ejected from the mouth in a violent fit of coughing. Those who recommended this mode of fitting have become so well aware of the defects above mentioned, that, to avoid these disasters, they have latterly adopted the practice of forming in the bone, of which the frame or sockets of the artificial teeth is composed, a projecting piece of the same material in the form, and answering all the purposes, of a clasp or collar; but this is a mere subterfuge to evade the imputation of employing metallic fastenings, and is much more clumsy.

Of the Grafting or Pivoting of Teeth.

I HAVE before stated the benefits to be derived from the skilful grafting or pivoting of teeth, instead of the

dangerous practice of transplanting them *(See remarks in the next page).* To prepare for the performance of the operation of pivoting in a perfect manner, the first care should be to ascertain the constitution and state of health of the patient, in order that any predisposition to inflammation in the system may be discovered; because, if that should be the case, and the nerve of the tooth be not previously destroyed, it will be necessary to prescribe the use of aperients and attention to diet for several days previous; and should the gums appear in a spongy or inflamed state, they should be lanced repeatedly, until they appear to have acquired a healthy state, which is known by their being pale and firm, and not bleeding from brushing. This precaution is only necessary in a few cases where the nerve is in a state of great susceptibility, as otherwise the operation is not attended with pain or inconvenience when performed by a skilful operator. When any of the front teeth are decayed or otherwise disfigured beyond the art of the dentist to restore them to their pristine state, they must be either nipped, sawed, or filed close to the gums, and if at all tender, it is the practice of many dentists to destroy the nerve which remains in the root, by introducing a hot wire, an operation both painful and dangerous from the repetition which is required to produce the effect. The plan I adopt is different, being effected by the rules prescribed for tooth-ache *(See Appendix).* After which a pivot is

screwed into the crown of the artificial tooth*, the crown or pieces having previously been nicely fitted to the roots from which the crowns have been cut away, and the pivot being introduced into the canal, lately occupied by the nerve, supports the crown of the tooth which thus displaces the decayed one, and, when well executed, joins so neatly as to defy the penetration of the most scrutinizing observer. This operation should always be submitted to before the decay extends to the gums, as the roots may then be preserved and made serviceable for years.

Of the Transplanting of Teeth.

The excellent practice of grafting or pivoting of new crowns upon the roots of decayed front teeth, is now so generally adopted, as to have nearly, if not wholly, exploded the practice of transplanting teeth†. In addition to which it may be properly advanced, that the innumerable objections transplantation is liable to, impresses all inquirers on the subject with such an abhor-

* This is always the practice when human or ivory teeth are used. The siliceous pearl ones, as before stated, have their pivots more securely fastened, being always soldered in the substance.

† There appears, *prima facie*, to be some ground for apprehension, that infectious diseases may be communicated by this operation; and on this account it may with propriety be deprecated, even were it in every other respect perfectly successful and unobjectionable; which, however, is far from being true; many cases of severe, and not a few of even fatal, results, are on record. On consideration of which I cannot avoid denouncing the operation as dangerous, and in the present state of our information, the operator who performs it is either grossly ignorant or unprincipled.—Bell, p. 168.

rence of the practice, as to render it extremely difficult to find a person who with a knowledge of these objections could be induced to submit to it*.

Of the Substances of which Artificial Teeth are composed.

The first dentist who had the good fortune to succeed in discovering a mineral paste as a substitute for the putrescible substances then, and, unfortunately still, in use, was De Chemant—he says in his Dissertation on Artificial Teeth, pages 1, 2, and 3, "In 1788, when I exercised the profession of a surgeon, I was consulted by a lady who had fallen into such a state of weakness as produced considerable fears for her life. On approaching her I perceived a tainted odour which I thought proceeded from her lungs or her teeth, which were black; I examined her mouth, and was struck with the bad state of a set of human teeth, implanted on a base of the tooth of the hippopotamus. This set of teeth being removed, I perceived her mouth to be almost entirely covered with small ulcers, and I had no doubt but that her disease was the effect of the putrid exhalations which proceeded from the set of teeth, and which corrupted the air she breathed; what confirmed this conjecture was, that after having laid these teeth aside, her health improved in a few days."

The putrescible substances from which artificial teeth

* Transplanting is the operation of completely extracting a tooth from its socket, and inserting another in its place, either from a living person or a dead subject.

have heretofore been generally made, are those of the teeth of the sea-horse, the elephant, and human beings —on all of which the saliva, assisted by the heat of the mouth, acts with such power as quickly to change their colour and dissolve their gelatine, after which they turn of a dark or black hue, their substance becomes soft, emitting a mixture of *gases* of the most offensive effluvia, and finally putrifies, melting away, and mingling with the saliva. Thus it becomes necessary to supply a succession of teeth, which occasions reiterated trouble and expense every two or three years, according to the constitution of the wearer, who sometimes destroy them in less than twelve months, notwithstanding their handsome appearance when first placed in the mouth. The Siliceous Pearl Teeth, on the contrary, never change their colour, are incorruptible, and will last for life.

It is universally known, that all dentists have been in the habit of using the crowns of human teeth taken from dead bodies for pivoting, and also for fixing on gold and other kinds of plates or bases, and De Chemant, pages 30 and 31, says, "A dentist of Paris had an opportunity of obtaining such teeth as he wanted from a person who attended the hospital called the Hotel Dieu. One day he took the teeth of a young man who had died of the small-pox ; these teeth were washed and infused in spirit of wine ; they were afterwards fixed upon a base of the sea-horse tooth ; but notwithstanding these precautions, these teeth inoculated the small pox, to

the Baroness of W——. The disease was particularly violent about the mouth, which disfigured her so much that she could scarcely be recognised." He then makes the following remark, "The use of dead teeth can only be attributable to ignorance or cupidity, because they do not require that skill and dexterity which is requisite to prepare artificial ones."

If the pains taken to purify the human teeth used in the disastrous case above cited (and where they did not even come immediately in contact with the gums but were fixed upon bases made of the sea-horse ivory) were insufficient to prevent infection, how much more liable to convey it must those teeth be, that are not so carefully prepared, which is seldom if ever done? when, therefore, we consider such melancholy results arising from such apparent remote causes, we may well shudder at the idea of uniting a perhaps contagiously infected crown to the natural roots of our own teeth, thus as it were inoculating ourselves with diseases, which are rendered more especially certain by the edge of the gums being more or less abraded by the operation, and consequently open to receive the seeds of infection from whatever source it may be conveyed.

To reconcile persons to the use of human teeth, they are led to believe that those used for this purpose are procured from healthy men slain in battle. This, however, is not the fact; but even if it were, the teeth of persons suddenly expiring must be very unfit substances, as the

blood, settled in the vessels of such teeth (as is always the case when persons are suddenly deprived of life) soon causes them to turn black; and there is no way of restoring their whiteness, but by bleaching them, which can only be done by frequently dipping them in water, and exposing them to the atmosphere, whereby their enamel becomes cracked, appears streaked, and can be of little use to the dentist; because, if the enamel be cracked, the pivot, which is screwed into the bony part under the enamel, for the purpose of fastening them, breaks the tooth; a circumstance that has frequently happened to me when in the act of drilling or enlarging the hole in a tooth, for receiving the screw. When human teeth do not break in the drilling, they are frequently known to break in the mouth, and fall out, from the moisture insinuating itself (more particularly through the cracks in the enamel) and softening the bone, until it reaches the drilled reception for the screw, which is thus rendered incapable of retaining the pivot—indeed, this consequence is a natural one, and needs no further comment, as it is well known by every day's experience, to be the fact.

The teeth, however, which are used, are generally obtained from persons within the meridian of life (as those of old people are too dark, and seldom free from decay.) The most delicate are such as are taken from young females; but even these are not healthy. Young people do not die without causes, such as fevers, consump-

tions, malignant and epidemic diseases, which makes it both dangerous and unpleasant to use their teeth. Indeed, the collectors of these articles never study the cause of the death of the party from whom they are taken: fortunately, however, such persons can have no further claim to support from the public now that a perfectly impenetrable and indestructible article can be obtained. But if recourse be had to any of the means of obtaining teeth before recounted, is it not shocking to the feelings (in addition to the probable consequences before adverted to), that such teeth should only find a sepulchre in the seat of taste—the very mouths of our most delicate females? Every argument in support of their use, while a far superior substitute is at hand, must fail, when placed in competition with these disgusting reflections—and will, it is to be hoped, stimulate every professional gentleman to use his best exertions to put an end to their abominable use.

As I deem the bare perusal of the preceding extracts from De Chemant, and my own observations, amply sufficient to convey conviction to the understanding of my readers of the deleterious effects of using animal substances of any description for artificial teeth, I shall not insult them by presuming to guide their choice in the selection of the article they may be desirous of substituting for their own lost teeth, but I cannot forbear to notice the prejudice which, I have recently been informed upon good authority, is attempted to be instilled

into the minds of the public, by some fashionable professors of dentistry at the west end of the town, against every species of improvement in artificial teeth; and who have deprecated, *in toto*, all those composed of mineral substances. As far as I am able to comprehend, this opposition can only arise from the total inability of the parties to make a mineral tooth of any description; and their incapacity as to fixing them, although the latter is one of the simplest branches of the department. Indeed it would seem that their principal art lies in inducing patients, by unfounded assertions of advantages, to wear teeth made from animal substances, which they can readily procure workmen to make, or those taken from the dead; and that patients, without reflecting that all such substances are quickly destroyed by the great dissolving power of the saliva, and the nauseous decomposition carried with it into their own stomachs, are so operated upon by the misrepresentations of such persons, as not only to countenance, but even to take them into favour, and promote their views. The reflecting part of the public, will, nevertheless, readily admit the necessity of, and give the preference to, mineral teeth, although contrary to the interested efforts of such gentlemen; and to an equal degree of certainty, select those minerals, the superior advantages of which have been tested by long experience. It is also probable that means may be used by the persons before referred to, for the purpose of biasing or prejudicing public opinion, by

attaching to the siliceous pearl teeth effects that they are not liable to: such as their liability to break in the act of mastication, an accident which is, in fact, almost impossible to occur, from their indestructibility. Such an objection is scarcely worth replying to. I have never known an instance of the kind happening to a tooth fastened in the secure manner in which mine are—a fastening which no other substance for the formation of artificial teeth, yet discovered, can endure. This, indeed, may be asserted with truth against other mineral substances, as the "terro-metallic," of which I have proofs in my possession, from patients who have had their places substituted by my siliceous pearl. The terro-metallic teeth, although advertised as being made in England, are all manufactured in France, and are here fixed and called by various appellations, since the successful introduction of my siliceous pearl; but the pivots (gold or platina) of the French mineral teeth are so slightly fastened to little more than their surfaces, that a very trifling pressure will cause them to break away from their fastenings*. The siliceous pearl, on the contrary, are so combined with the substance, of which the teeth are composed, one end of the pivot being passed entirely through the substance, and there soldered to it, forming as it were

* Such is also the case more especially with human and ivory teeth; they soon corrupt or separate either from the base or the pivot, owing to the holes in which they are screwed becoming too large, from the substance of the tooth being dissolved, as before stated, by the saliva.

one body, while the other end of the pivot is soldered to the gold plate, or bed, which rests upon the gums, that there never can be any movement of it, by which it can possibly bend or break. In fact, all the objections that have or can be made to mineral substances, I have had the good fortune to overcome by my invention—as the teeth composed of it can not only be made to match any shade of colour* which the neighbouring teeth may require, but can also be made in sets to assume and retain the appearance of the most beautiful natural teeth and gums, without possessing any of the rough and unpleasant feelings to which the most superior of all other mineral teeth are subject; but, as I have before observed, they are fitted with all the precision and solidity necessary to render them both comfortable and useful, and as such may be fully depended upon, advantages that teeth supplied by any other dentist do not possess.

The siliceous pearl possesses all the following qualities: 1*st*. That it is composed of indestructible fossiles, and never contracts on being vitrified in a furnace after having been accurately fitted to the model of a mouth.—2*dly*. That it can be made to imitate all the appearances of the natural teeth (or gums† if requisite) in their transparent qualities

* All other mineral teeth are limited to a very few colours.

† "The loss of the teeth causes the sinking down of the gums, proceeding from the absorption of the alveolar processes (sockets); from this arises the deformity of the mouth; it is not possible to

and shape, and is, in short, the *desideratum* so much required, but never before attained, both in the material of the composition and their natural appearance.—3*dly*. That the texture of the mineral is such that it will polish with a mill similar to a gem, and although not frangible by any common force, is, nevertheless, capable of being fitted with a precision equal to any other substance.—4*thly*. That it cannot be acted upon by any acid, the *fluoric* excepted, and that it withstands all the effects of the blow-pipe in soldering and of the instruments used in rivetting.—5*thly*. That it possesses in an eminent degree the properties of an enamel, throughout its entire substance; and, when abraded, which can only be effected by grinding on the hardest stone, presents a perfectly smooth surface.—6*thly*. That it will assume any shape and colour required without alteration, for any length of time.—7*thly*. That it is incorruptible, either from the effects of saliva, heat of the mouth, or any action to which it is subjected in the performance of the operations for the especial purpose of which I invented it.

After saying thus much, it is unnecessary to add, how totally impossible it is that any offensive odour can ever

remedy this with teeth of animal substance, since gums of a natural colour cannot be added." On the contrary—"With mineral substance we have the double advantage of being able to substitute artificial gums, and to give them a durable colour resembling nature."—De Chemant.

"After the teeth are gone, the face is shorter, while the mouth is shut, by almost the whole lengths of the teeth in both jaws; that is about an inch and a half."—Hunter.

arise from it; in fact, I have studiously endeavoured to discover any defect it might possess with a view of remedying it, but I have not been able to find in it a single imperfection.

In attaching to the "siliceous pearl teeth" that perfection which I have dilated upon, with some degree of pride, I must confess, resulting from an happy issue to my incessant application and laborious research, I am aware that I subject myself to the various charges of egotism, conceit, &c. I am also aware, that "*mere assertion*" is not proof. To these charges I answer, that my practice and experience have sufficiently satisfied me, and every one I have operated upon, without a single exception, of the correctness of my positions; and as "*mere contradiction*" is no more proof than bare assertion, I invite all such as have any hope of maintaining the contrary positions, to accompany their observations with as strongly corroborative circumstances as I have adduced in support, and the question will be then fairly at issue; the result of which I shall encounter with the greatest pleasure; founded on my present conviction, that it must be in corroboration of my assertions.

At the period of perfecting my inventions, I submitted them to some of the most scientific and learned gentlemen of the faculty, and I have had the satisfaction to find the results of their inspection meet my wishes. To their testimonials to this effect I have called the reader's attention in the beginning of this work; in addition to which, I

consider their entire approval and adoption by so great a number of the higher and more respectable classes of society, may be referred to as a proof of their entire success.

I have in my possession specimens of all the different materials and substances of which artificial teeth have been made for the last fifty years; both such as have been used in the mouth (the decomposition of which will excite wonder) and such as have not. All of which are open to the inspection of the curious, at my residence.

Of the Teeth Renovator.

"He who pays no attention to his teeth, by this single neglect, betrays vulgar sentiments."—LAVATER.

MANY persons who object to the operation being performed of grafting or pivoting their decayed teeth, from the fear of pain, or for other reasons, are yet very desirous of appearing to possess good teeth—whilst others, who are sufficiently able to masticate their food with the teeth they possess, exhibit so repulsive an appearance as to induce a similar desire. In order to effect this highly desirable object, I invented the renovator, which is made of the same materials, and possesses all the good qualities of my artificial SiliceousPearl Teeth.

This renovator is so constructed as to act on the front teeth as a mask does to the face, and gives them all

the appearance of health and regularity. It can be slipped on or off in a moment; and adheres perfectly secure without any fastening, being made upon the principle of precise adaptation to every interstice of the teeth and gums which it embraces. It can be made to any shade of colour—is of a delicate appearance, not being thicker than parchment—cannot be distinguished by the most scrutinizing observer from the person's natural teeth, covering every imperfection of them, or discoloured artificial front teeth, and, with a little care, will last for many years. In cases where a tooth or more are lost, they can be included, in the formation of the renovator, so as not only to restore the articulation, but the appearance of the intermediate teeth.

In conclusion it may be necessary to inform my readers, that while I fit artificial teeth of all substances, according to the desire of my patients, in the most scientific manner, by means of a machine of my own invention, which obviates the uncertainty of depending upon the hands alone for the fitting of artificial teeth and pallets with accuracy, I also prepare the composition and form the Siliceous Pearl Teeth in all difficult and complicated cases (for which purpose I have furnaces of great power erected on my own premises) and am enabled to adapt them with a greater precision and resemblance to nature, than when the several branches are performed by different hands.

A few years ago the author submitted the machine (above mentioned) for accurately fitting artificial teeth, to the inspection of two eminent dentists, who were pleased to favour him with the subjoined letters:—

"Sir,

"I have examined the model of your instrument for producing greater accuracy in fitting of artificial teeth, and I think it must be very useful, especially to those who have tremulous hands.

"Yours, truly,

"JOHN HEATH.

"Mr. Scott,

"*April* 21, 1828."

"Dear Sir,

"Your little machine, which I inspected yesterday, seems to be a very well-constructed thing for the purpose, and, I have no doubt, will be very acceptable to any practitioner who finds occasion for such.

"Yours, truly,

"SAMUEL MINSHULL.

"J. Scott, Esq

"*Tuesday, April* 22, 8[illegible]."

APPENDIX.

THE *formula* of the various medicines required in the operations directed to be performed in the course of the work will be found in the following list, and can be procured at any apothecary's shop, with the exception of those marked with an asterisk thus (*), which, with the instruments necessary for the same purpose, may be had *separately* of the author, at his residence, 6, Lower Grosvenor-street, Grosvenor-square, London; or in *Cases*, provided with anodyne cements, tinctures, stoppings, dentifrices, &c, &c., together with the various instruments and brushes necessary for performing operations on the teeth, which are arranged for the convenience of medical practitioners, heads of families, ladies' toilettes, or persons travelling. In each *Dental Case* will be found two different coloured siliceous pearl teeth as specimens of the author's own make, together with the following:

* The Dental Mirror, (marked *a*)—This is a concave glass, for inspecting the interior of the mouth, into

which it is easily admitted, being small ; by means of which, and standing in front of a looking-glass, the observer can perceive the state of the interior circles of the teeth, and perform any operation they may require (within an individual's power.)

FOR GANGRENE, OR CARIES.

* Files.—The files to be used in this operation are of two kinds, both of which are extremely thin, being little thicker than a watch-spring. One of them is armed with teeth on one side only, the other side being smooth. This file is to be used when the side of one tooth only is affected by the above disease. The other file is armed with teeth on both sides, and is used when the sides of two adjoining teeth are affected. The latter file is also used to separate the front teeth of young persons, when, at about the age of fifteen or sixteen, they appear to press too closely upon each other. Two other files for removing ragged edges of the teeth or fangs will also be found in the case.

* Excavators (marked *b.*)—Of these there are five in each large case, and in each small one two, which will be found sufficient for individual use ; they are so formed as quickly to point out to the discerning operator their separate uses—being concave, sharp-edged, and adjusted for scooping out the unsound

bone in different directions from all parts of the cavity.

* ENAMEL CUTTER (*c*).—This is a round tapered file, which acts upon the enamel by a careful compressive and rotatory motion, and is to be used for enlarging the orifice of the cavity, when wanted, for stopping.

* PERMANENT COMPOSITION, OR CEMENT (marked with a figure 1.)—After excavating the unsound tooth according to the directions laid down in page 25, should the tooth feel tender—(*See Tooth-ache and Tender Teeth*), proceed as the instructions for that disease point out;—but should the contrary be the case, after the cavity is perfectly dried with lint, light the small lamp (*d*) and take the copper bowl instrument (*e*), which will be found filled with the composition (1) and warm it over the lamp sufficiently to soften it, which is almost instantaneously effected, as, similar to wax, it only needs softening—not liquifying; then, with the scoop (*f*) a sufficient quantity for filling the cavity of the tooth should be taken up at one time, and, if the situation will admit of it, be pressed into the tooth with the finger. If the position of the cavity of the tooth be such as not to admit of the foregoing process being performed, the composition must be taken out of the warming bowl with the spatula, (*g*) in the best manner that the case will admit of, for filling the cavity,

which, if in a tooth in the upper jaw, the patient must not only lean back, but must also allow his head to incline downwards. Great assistance will be rendered to the operator by using one of the four instruments (*h* and *i*) warmed in the composition contained in the bowl instrument. Having by these means filled the cavity (taking care that it be not over filled, which will be discovered by the point of the antagonist tooth coming in contact with it; in that case the overplus quantity must be removed, and the remainder made even on the surface with the spatula warmed as before directed in the composition) after which the surface ought to be smoothed with a cold instrument (*h*) to prevent any lodgment or adhesion of food, &c. The cement will be immediately fit for masticating the hardest substances. Should it afterwards be discovered that every interstice has not been perfectly filled, the surface of the composition should be wiped dry with lint, and a warm instrument again applied to it to press it more firmly into the interstices that before escaped the operation. Sometimes, however, it will be found necessary to apply the solvent (2) which in the course of a few hours will reduce the composition to a soft mass, when, if in a tooth in the upper-jaw, it will fall out of itself—or if in the under-jaw, it can be easily taken out with one of the excavators,

and with the same facility as any other soft substance. If, however, it should be required to remove it immediately, the surface of the composition must be covered with the solvent, and an instrument slightly warmed being rubbed upon it, the composition becomes liquified and mixes with the solvent, when it can be instantly removed. After which, if the tooth be not tender, the stopping can be proceeded with as before, until it is perfectly accomplished*. The crowns of some teeth are affected with gangrene in more parts than one, in which case each cavity must be treated as before directed. When gangrene or caries attacks two adjoining teeth, the difficulty of stopping both, may sometimes render it necessary to extract one to save the other; to discern justly the necessity of proceeding to this extremity, however, requires much skill and experience.

FOR TENDER TEETH AND TOOTH-ACHE.

* SEDATIVE TINCTURE † (3).—When a tooth is exter-

* By excluding air and moisture from the cavities of decayed teeth, we preserve the remaining fibres of the bone from inflammation, and, consequently, from decay.

† To distinguish the use of this tincture, I have called it, in the course of the work, Sedative Tincture for tenderness of the teeth, and Anodyne Tincture for tooth-ache; both names are applied to the same preparation, for the purpose of showing that it possesses both properties.

nally or internally attacked with inflammation, (both of which I shall treat of under one head, as requiring the same remedies, although attended with different degrees of pain, according to the different stages of the disease and the heighth of inflammation), it is generally discovered, by a tenderness being felt on their touching each other, or on their being pressed with the finger, without any visible sign of gangrene; in such cases the nerve, or the external membrane is doubtlessly inflamed, although no pain be felt, and the gums should be lanced on each side of the affected teeth down to the sockets, being first careful to remove the tartar, if any; after which, thirty drops of the Sedative Tincture in a tea-spoonful of water should be held in the mouth to the affected teeth, three or four times a day, and the lancing repeated at the interval of a week, which will remove the tenderness. If the Sedative Tincture be applied mixed with as little water as possible, that is, as strong as it can be borne in the mouth, the lancing of the gums may often be dispensed with; but when tenderness arises from a gangrenous tooth, which is internal, being an inflammation of the fibres of the bone near to the nerve, take a bit of lint (the film only which should be carefully deprived of any fibres by scraping), dip it in the Sedative Tincture, and dress the cavity with it five or six times a day, as the

more frequently it is used, the sooner the tenderness will be removed, taking care that a fresh bit of lint be used each time, after which the process of *stopping* may be proceeded with as directed under the head of *Permanent Composition.*

* ANODYNE TINCTURE* (3).—When gangrene is so extensive as to destroy the bone so that the nerve of the tooth is exposed, the pain arising therefrom, is called tooth-ache.† In this case the lint and tincture must be applied as above directed, with this difference only, that the application must be repeated every five minutes during the violence of the paroxyism, and then not to be pressed in, but laid as lightly in the cavity as possible, which generally removes the pain in three or four dressings. The removal of this pain, however, depends, in a great measure, upon the care with which the remedies are applied. The smallest fibre

* See the preceding Note.

† The sympathetic affections to which it gives rise, are exceedingly various and important; though it is only of late years that they have been properly understood, and the attention of medical men directed to their true source. Now, however, that these remote sympathies have excited a degree of interest more commensurate with their importance, so frequently are they found to occur, that practitioners are, on the other hand, in danger of attributing to this cause diseases which have not the remotest connexion with it. It not unfrequently happens that parts the most remote become the apparent seat of pain, from the exposure of the nerve of a tooth. I have seen this occur not only in the face, over the scalp, in the ear, or underneath the lower jaw, but down the neck, over the shoulder, and along the whole length of the arm.—BELL

in the lint will irritate the nerve, and cause, rather than allay, pain. Care must also be taken that no tartar be on the tooth, and that no particles of food or decayed bone remain in the cavity, as, in that case, the tincture cannot reach the nerve, nor consequently, have the desired effect. I recommend, when retiring to rest, that the dressing, *with fresh lint each time*, should be repeated two or three times successively, as the powerful effects of the tincture is frequently weakened by the flow of saliva. If it can be borne, the cavity should be dried each time with a bit of lint affixed on the end of a small metallic probe. After the pain has ceased for a day or two, the stopping of the cavity may then be proceeded with as above directed. If in the first attacks from tendernesss, or tooth-ache, or swelling of the gums, *immediate* recourse be had to the tincture, it will assuredly remove it; but if, on the contrary, its application be delayed, it is often necessary, in addition to the above process, to lance the gums as before described, or three or four leeches should be applied to the gums at the neck of the painful tooth, or teeth. In obstinate cases, aperients, emetics, and fomentations to the face over the affected tooth, or even blisters under or behind the ears, anodynes, internally administered, tonics, and, in nervous and rheumatic cases, rubefacients also may be required, according

to the state of the sufferer's constitution, who should be restricted to a spare diet.

* Anodyne Cement (4).—This preparation is of a mild and healing nature, as before stated, and inflammation may always be allayed or prevented by the judicious use of it or the sedative tincture, both of which possess antisceptic powers as well as sedative, especially the latter; but, for a wounded nerve, as in mastication, the former possesses the most healing power, after the irritation has been allayed for a few moments by the application of the tincture. On the slightest tenderness being felt, therefore, the tincture should be had recourse to, as the vessels of the bone of the tooth, from the density of their structure, cannot again restore themselves to health, but will inevitably die away; after which, if the sensibility of the nerve be very great, as from exposure it frequently is, a drop of this cement should be introduced (with the scoop *f*) into the cavity of the tooth, as it not only soothes, from the nature of it, but, by acquiring consistency, and adjusting itself to the nerve, it excludes the atmosphere, particularly if a bit of lint dipped in the cement be placed on the end of the probe and put over the cement already in the tooth; after which, the patient should, with the tongue, or a wetted finger, gently press it down, to secure the filling of the cavity and an even sur-

face. This dressing should be repeated every day, or every second day at farthest, particularly if there be any signs of blood or matter, as the odour of the latter will become offensive and painful, as any other wound would, whose dressings were neglected; and should the pus not be allowed to vent itself by this means, it is sure to descend and form an abscess in the gums at the point of the fangs, and there break, as mentioned under the head "Gum Boils," in which case an early use of the lancet, as well as astringents and sedatives, must be applied. The lint can only be removed with the ternaculum, or hooked and pointed instrument *(k)* or one of the excavators *(b)* may be used. When the cement is used in preference to the tincture, care should be taken that the quantity of lint should be very trifling, if the cavity be deep and conically shaped; otherwise, as the cement soon becomes harder, its removal may be attended, not only with trouble, but pain; to obviate which, another layer of the cement, if the depth of the cavity requires it, should be mixed on the slab (*l*) with the spatula (*g*) with the absorbent powder (5 *) till it attains the consistence of honey, a layer of which should be placed over the lint, which will cause the whole to be more easily removed when required. To render this, if possible, more plain, proceed as follows:—1st, With the scoop, drop into the cavity as much cement as

will cover the nerve. 2dly, Dip a bit of the film of the lint into the cement and cover it over what was previously put in, so as to prevent it and the top layer from coming into contact with each other. 3dly, Cover this lint with the compound (cement and absorbent powder) before named. By following these directions the nerve will soon become healed or absorbed, when, in either case, it can be stopped, as before directed. If any portions of the cement should adhere to the teeth or the fingers, in the performance of the operation, or after, the corner of a napkin, dipped in spirit of wine (6), will remove them. I mention this circumstance to prevent such specks from being taken to be a decay of the tooth, as also to convince the reader that the preparations are perfectly harmless. In superficial decay, where a tooth cannot be permanently stopped, for want of cavity, as is sometimes the case with front teeth, this cement can always be applied; and, if the part be first well dried with a bit of lint (cotton is always injurious), this cement will adhere until the sensibility of the nerve is destroyed. When anodyne or sedative cannot be immediately procured, the following tincture will be found serviceable:—Spirits of camphor, tincture of opium, tincture of myrrh, and compound tincture of benzoin, equal parts mixed.

* Astringent Lotion (7).—To be used to the gums

after lancing, bleeding, &c. from ten to thirty drops, mixed with a little water, according to circumstances; after bleeding this should be used two or three times a day. For sponginess only of the gums (after being well brushed) once a day will be sufficient. If gum-boils appear, equal parts of the astringent and sedative (3) should be used, as strong as it can be borne.

* Scaling Instruments (*m*).—These are to be used as convenience requires for removing the tartar. Their different uses for which purpose will easily be recognised by any intelligent person.

* Absorbent Dentifrice, or Vegetable Tooth Powder (8).—This preparation should be plentifully used every morning with a hard brush, as recommended in page 46, with cold water in summer, but in winter the extreme chill should be taken off.

* Rubefacient.—This is a liniment which should be applied to remove soreness, or swelling, and to alleviate pain. It should be rubbed from the ear along the under jaw-bone, on the cheek, and over the tooth or teeth affected. A bit of cotton well moistened with the liniment should also be put into the ear on the affected side, and should be repeated nightly if required, particularly if the patient be affected with nervous or rheumatic symptoms.

* Solvent (2).—This compound is to be used with the

scoop instrument when the permanent composition, used for stopping, is at any time wanted to be removed; when a portion of it must be laid on the surface of the composition, as directed under the description of PERMANENT COMPOSITION.

CAUSTIC, OR NITRATE OF SILVER.—This is used after excrescences have been cut away from the gums, when the affected part is simply touched with it, to stop the hemorrhage and produce a healthy surface. It is also used in the proportion of one drachm of caustic to an ounce of water, with a camel-hair pencil, when the edges of the gums are exceedingly tender or ulcerated; and is applied in the same manner to the cavity for several successive days, after an excrescence there has been cut away. After which it must be dressed with the anodyne and sedative. Care must always be taken to remove any cauterized or black surface that may appear in the cavity, or the inflammation will certainly return. After applying the solution of caustic to the gums, the mouth should be rinced with water.

INTERNAL ANODYNE.—During and after a violent paroxysm of tooth-ache, the following mixture, to appease the irritability of the system, will be found serviceable:—Mixture of camphor four ounces, tincture of fox-glove half a drachm, tincture of henbane one drachm, compound spirit of sulphuric ether two drachms, to which add water sufficient to

make eight ounces; one table spoonful every second, third, or fourth hour (according to the irritability of the patient) to be administered to an adult.

EMETIC.—Take of tartar emetic five grains, mixed in twelve table spoonsful of warm water, one table spoonful of which must be taken by an adult every ten or fifteen minutes till it has the desired effect.

APERIENT.—Take of Epsom salts two ounces, mix in a pint of water, and take a wine-glass full every two hours till it operates, or two wine glasses full, night and morning, according to circumstances; or the following may answer the purpose better:—Of senna one ounce, ginger one drachm, boiled in a pint of water, to which add two ounces of Epsom salts, and take a table spoonful every three or four hours.

FOMENTATIONS.—Simple hot water, or infusion of camomile flowers and poppy heads may be used as hot as can be borne, applied with flannels to the affected part, but should never be continued above one hour, lest the effect desired be counteracted and debility &c. follow.

OBSERVATIONS.

THERE are many persons who advertise to cure tooth-ache or tender teeth with unrivalled *cements*, as they term them, but who, from the improper substances they use, occasion almost inconceivable injury to the persons

they operate upon. One gentleman, a respectable dentist, has informed me, that within the short space of a fortnight, he has been obliged to extract seven teeth that had not long before been stopped by the substances now in common use by some who are considered *eminent dentists.* If so many failures occur in the course of one person's practice, how great must the evil be in this vast metropolis. This, however, may in a great measure be accounted for by considering that, in addition to the injudicious stoppings used, the inflammation (if any) is seldom previously allayed, or the decayed bone removed previous to filling the cavity.

Before a patient allows a tooth to be stopped with any substance (gold or foils excepted) for which a solvent has not previously been provided (which is the case with most, if not all, of the stoppings now in use), he should cause the operator to exhibit how such a substance, as is about to be placed in his tooth, can be removed, should occasion require*; otherwise, he must expect, should a return of tooth-ache occur, to suffer not only its pain, but a similar result as that experienced by the gentleman mentioned in another part of this work (*See note p.* 42). Had that gentleman had my composition and solvent, the stopping might, with ease,

* This simple question would often astound the operator who now unobstructedly fills the cavities of the teeth with succedaneums under the various appellations of "Cements, Anodynes," &c., and might give the discerning patient an opportunity of judging into what hands he had fallen.

have been removed—the tooth-ache cured, and the tooth again stopped and rendered serviceable, perhaps for life.

To describe all the empiricism to which dentistry has for many years been exposed, would fill a volume. The little attention bestowed by most persons upon the teeth, together with the want of knowledge in the management of them, has induced numbers of crafty men to decline other employments to profess dentistry; indeed, the rage to become dentists has now reached to such a climax, that men, bred to the meanest occupations, both English and foreigners, now profess not only to perform *instantly* all the most difficult operations in this science, but have even had the audacity to compile treatises on it, and to venture their opinions to guide the public in the choice of an article with the qualities of which they are themselves unacquainted.

Many of these pretended dentists fit artificial teeth in such an unskilful manner that they are neither an ornament, nor are they of any service for the purposes for which they were intended. A literary gentleman, tolerably conversant with the nature of artificial teeth, appeared surprised when I informed him that, when properly fitted, they answered all the purposes of mastication, &c. because some of his acquaintance are under the necessity of removing them at every meal. This is the result of unskilful workmanship, proceeding from the injudicious manner in which they are fitted to the gums, or from their improper construction. Thus,

for instance, a person repairs to a self-styled dentist to supply the deficiency of a tooth or teeth, and is shown different specimens of exquisite workmanship. Being charmed with their handsome appearance, orders are given to supply the deficiency, the person so ordering not being aware that these specimens are taken from the hands of workmen or assistants who are wholly unacquainted with more than merely fitting them to a model, a totally different operation from the precise fitting of the mouth, which can only be skilfully done by artists well versed in the anatomy of the jaw and proper use of the teeth (a part of the science understood only by a few of those who are regularly-bred dentists). Hence so many failures occur, that many persons attribute to a deficiency in the art, what in reality results from the unskilfulness of the artist, who, from want of ability, merely places the teeth in the mouth instead of accurately fitting them. All pieces after being constructed on a model require to be carefully fitted to the patient's mouth, otherwise they never can perform the office of mastication.

It is impossible to lay down rules for detecting every species of imposition that may be practised by the untaught professors of dentistry; but if the foregoing remarks be attended to by persons requiring artificial teeth, those pretenders must try to acquire a knowledge of fitting them upon more scientific principles. In saying thus much, however, I wish it to be understood that it is

not my intention to endeavour to prevent any ingenious artist from following a profession for which he is competent. My object being merely to advocate the perfect principle upon which artificial teeth can be made to answer all the purposes of natural ones, and if I have succeeded in my endeavours, I shall feel heartily gratifiedin having rendered myself in some measure useful to society.

FINIS.

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